THE

Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

Vol. VIII. CHICAGO, MAY 14, 1887. No. 20.

ABSTRACT OF A LECTURE
ON
ANTIPYRESIS AND ANTIPYRETIC METHODS.[1]

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In analyzing the views as to the value of antipyretics we may group authors as follows: 1. The extremists, who use only the cold bath, and reject internal antipyretics (Brand, Vogl, Winternitz and others). 2. Those who use luke-warm baths, but reject internal antipyretics (Naunyn and others). 3. Those who, according to indications, use strict and moderate hydrotherapy and internal antipyretics (Liebermeister, Jürgensen, Riess). 4. Those who imagine fever to be a kind of necessary and salutary regulation, arrangement or mechanism, and use antipyretic interference only on the appearance of dangerous conditions or complications (Heubner, Curschmann, and others). 5. Those who regard fever as necessary, reject antipyretics, and only use dietetic measures (Gläser). 6. The class who absolutely deny an influence of therapeutics on the mortality of typhoid (Port).

We thus see that all possible conceptions have their supporters, and all parties assert the correctness of their views on grounds that, in their opinion, will stand any test. It would be a lamentable state of affairs if in this way physicians should become sceptical; and especially if, after a period of active antipyresis with its satisfactory results, we should be drawn, by a reactionary movement, into the therapeutic indifference of the Vienna school. Against such a movement, all who understand the subject, and especially clinicians, must fight; and it is pleasing to know that at the IV Congress für innere Medicin those who expressed themselves against antipyresis were divided and made but little impression.

Has the antipyretic treatment of highly febrile infectious diseases, and especially of typhoid fever, a favorable influence on the individual case? Has it the same or a corresponding influence on the totality of cases of disease, and also on the mortality? Both questions we must answer affirmatively. Observations at the bedside prove the first, and the concordant statistics of the clinician the latter. We can affirm with certainty that the course of the individual case is more favorably and less dangerously shaped under judicious and antipyretic treatment; and, on the other hand, that the mortality of typhoid fever has fallen at least to one-half its former rate.

Against these propositions different objections have been raised. On the one hand (Fiedler), the decrease of typhoid (both as to number of cases and mortality) in the larger cities, is referred to their health regulations, and certainly with truth. Our observations in Munich have shown the influence of these regulations. Nevertheless, the relative decrease of mortality can scarcely depend on the healthfulness of the soil, but on the character of the epidemic, and doubtless also on the methods of treatment, as I will show later. On the other hand (Port), the ratio of mortality (the severity of the epidemic of typhoid) is connected with the state of the soil-water. From the statistics of the Munich garrison for the last ten years Port finds that the fluctuation of the soil-water is more an index of the severity than of the size of the epidemic. From this he draws the conclusion that antipyretic therapy is without any influence on the mortality, since the reduction of the former mortality from 20 to 2 per cent., as shown by the tables of the hospital of the Munich garrison, would be impossible without the discovery of a specific remedy. But Vogl, chief physician to the garrison hospital, has shown, by using the same material as did Port, that Port's hypothesis is untenable. We must wait for other material before further estimating Port's conclusions.

Such works as that of Vogl are of the greatest value for the further development of the antipyretic therapy of typhoid fever, because they are based on very similarly situated material—strong young men from 20 to 22 years under corresponding and almost similar external circumstances—with well disciplined attendants schooled to a certain method—a cold bath at 63.5° F. lasting a quarter of an hour (with a rectal temperature of 102.2° F.) about every three hours, winter and summer, in unheated rooms, with the windows opened day and night. The result of this experiment speaks clearly enough: the number of deaths from typhoid fever by this treatment, without the use of medicines, in the years 1875 to 1882 (inclusive), was 28 in 520 cases of the disease, while in the other divisions of the same military hospital, in which a more mild water treatment was used with internal antipyretics, there were 52 deaths in 610 cases in the same time. This is, then, a mortality of 5.4 per cent. by the exclusive Brand treatment, and

[1] Translated, by permission, from advance sheets by Wm. G. Eggleston, M.D., of Chicago.

a percentage of 8.5 by the combined method. From this we may perhaps draw the conclusion that in military hospitals under the given conditions the energetic Brand's cold water treatment is superior to the modified treatment, and that combined with antipyretics, and that, as a rule, it gives the best results in typhoid fever. This conclusion exactly corresponds to what has been the case in the Prussian army since 1865, since which time the mortality from typhoid fever has fallen from 25 to 8 per cent.; this, according to the report of the Prussian Minister of War, is due principally to Brand's cold water treatment, though partly also to improved hygienic conditions and better individualization in treatment. The present results in the Prussian army are entirely independent of local, temporary, and individual influences.

But though these results, taken with the former publications of Brand, Jürgensen, Liebermeister, and others, show that there is no doubt that Brand's method is best in military practice, the case is somewhat different in civil practice. We cannot introduce Brand's method directly into civil hospitals and private practice: there is a lack of trained attendants and that degree of discipline which forbids opposition on the part of the patient or carelessness on the part of the attendant; and again—and this is a most important point—the clinical material of the civil hospital and private practice is different and much less fit for such energetic cooling as Vogl carries out both by regulating the temperature of the barracks and the bath. Consider the circumstances of age, sex, anomalies of development, pregnancy, anomalies of constitution and nutrition, bad dwelling, inebriety, occupation, scrofula, tuberculosis, chlorosis, anæmia, cardiac affections, syphilis—these are the things with which, in addition to typhoid, we have to contend in our typhoid paitents in civil practice. The military physician should not forget them; he has a better mortality percentage because he has the flower of the youth of the whole country in his hands, with all uncertain and precarious constitutions excluded, while we have to treat the miserable people in all their unfavorable conditions.

With the strict Brand-Vogl cold-water treatment we will now compare the results of a pure but somewhat modified hydrotherapy in a civil hospital. As representative of this method I place Naunyn before all others. He has not a large amount of material at his command, but it is large enough to cast into the scale. By his modified method Naunyn lost 10 of 145 cases, or 6.9 per cent.; certainly a favorable percentage. His method is as follows: When the axillary temperature (which is measured every three hours) reaches 103.1° F. the bath is given, usually eight baths in twenty-four hours, and in most cases between noon and midnight. Naunyn divides the baths according to temperature into: cold (72.5° to 81.5° F., duration five to ten minutes), luke-warm (from 81.5° to 90.5°, ten to fifteen minutes), and warm (90.5° to 95°). The warm baths are given in the later stages in very actively delirious patients with great restlessness and muscular weakness. For several years Naunyn has not given baths at a lower temperature than 72.5°. The diet consists of 1.5 litre of bouillon with an egg, rarely two eggs, 1 litre of milk, 1 roll, 1 litre of water or 1.5 litre of wine or sometimes 1.5 litre of grog (consisting of 0.5 litre of rum, 50 grm. sugar, and hot water).

We come now to those authors who use combined antipyresis, the combination of baths and internal antipyretics, according to the indications of the individual case. This group appears to embrace by far the greater number of clinicians and physicians. The statistics published by them correspond entirely, if we recognize the statement as correct that typhoid usually gives a less mortality in small than in large cities. With this method of combined antipyresis there is great play for modifications of the methods of treatment, and it is not impossible that the methods of the clinicians using this are all different. The cold, luke-warm and warm baths, the gradually cooled and the prolonged luke-warm bath, the cold douche, the moist pack, the cold fomentation, the simple sponging, and of internal remedies quinine, antipyrin, thallin, salicylic acid, kairin, hydrochinone, antifebrin—all these have their friends and supporters.

You will now ask: Which method of antipyresis shall we employ in our cases? What kind of hydrotherapy shall we use? And under what circumstances shall we use antipyretic measures? Our discussion of these points must begin with a consideration of those changes which antipyresis is intended to and can control. As the name shows, it was at first thought that the object of antipyretic treatment was the fever alone, and the factors from which the conception fever arises, principally the high temperature of the blood and tissue. This opinion, which was mainly defended by Liebermeister, arose from the idea that the high temperature of itself, especially if of long and uniform duration, was dangerous, and threatened life. There is no doubt as to the dangers of hyperpyrexia, but it seems that the high temperature has usually not the significance which Liebermeister at first attributed to it. The severe cerebral symptoms, the cardiac degeneration, renal troubles, the trophic disturbances, do not seem to be the effects of the high temperature, but co-effects of the dangerous process, the infection, causing the fever.

We may now answer the question as to what antipyresis should do, by saying that we must first widen our conception of the word; it is not merely a battle against fever-heat and its action, but also against the carriers of infection and their destructive products and actions in the organism. To take an exact position between the fever action and the microbe action is not possible at present. Naunyn has cleared up many points, but much is still dark. Naunyn concedes the acceleration of the heart's action and respiration as the influence of over-heating. The troubles of the nervous system, of the blood and its vessels, of digestion, of tissue change and secretion, he places to the account of the infection. But the proofs which Naunyn gives are mostly of a negative nature, and there are still many doubts, especially as regards the nervous and circulatory troubles, as to the innocence of the fever. The cases of aseptic fever, in which there is no other trouble than high tempera-

ture, are very exceptional; and we must also regard as exceptional those cases in which, especially among the lower classes, the nervous system is but little or not at all affected by the fever, so that the patients continue to go around, and even to work for days after the beginning of the disease. Against these we may place those cases of extreme susceptibility to fever, usually occurring in persons of nervous constitution.

I mention these things in order to show that the absence of nervous symptoms in individual cases does not prove that as a rule there are no nervous troubles in fever as such, but that they depend on the infection. I have no doubt that fever itself affects the nervous system, and slightly or more severely according to the height of the temperature. On the other hand, I think that the cerebral troubles may be conditional upon the infection, as shown by the cases with severe prostration of cerebral function with comparatively low temperature, as in typhoid fever, for example, the early loss of consciousness and the active delirium in the first days of typhus fever, the severe nervous troubles in many cases of acute sepsis, in which there is no or but little fever. In the same way are the boundaries between the limits of action of the fever and the infection in the circulatory and respiratory troubles uncertain. That the acceleration of the heart's action and of respiration depends on the fever may perhaps be regarded as proved, as it is probably proportional to the relaxation of the vascular walls, which may be recognized by the constantly noticeable dilatation of the arteries and capillaries during fever, as well as by the sphymographic tracings. The relaxation of the peripheral vessels which is peculiar to fever can be attributed to nothing else than paralysis of the vaso-constrictor nerves, since, as Bäumler has shown, the reaction of the vasculars to irritation of the skin (stroke with the finger nail) is very prompt. If, then, the troubles mentioned are caused by the fever, we must, on the other hand, refer the nervous troubles, disturbances of organic tissue-change, of the quality of the blood, and of secretion, perhaps entirely or in the greater part to the infection: the paralysis of the heart, the reduction of the number of red blood corpuscles, the deficiency of alkali and carbonic acid in the blood, the generally increased excretion of urea (especially the large epicritical), the albuminuria, and the trophic disturbances of the muscles and skin.

We will now consider the antipyretic measures in connection with these disturbances; how and to what extent the former affect the latter. Hydrotherapy deserves to be considered first; according to the experience of all competent observers it has the first place, because it conbines in itself all the attributes of a remedial measure necessary in these cases, and its action on the fevered organism may be varied to any degree. But the mistake must not be made of supposing that the favorable action of the cold water treatment has been particularly proved in typhoid fever, whilst in other febrile diseases, such as pneumonia, erysipelas. and acute phthisis, it is shown to be much less applicable. In the last-named affection a favorable influencing of the general condition is not to be mistaken. The action of cold and lukewarm baths may perhaps be defined as follows: The bath acts on the fevered organism by cooling the blood at the periphery, and then by the return of the cooled blood from the skin to the interior of the body and to the internal organs. Whether this stream of cooled blood has an immediate effect on the central nervous apparatus is not certain, but I believe I may conclude from a personal experience (a severe attack of typhoid fever in 1874, during which I was bathed a great deal) that the immediate effect after the bath and the first effect of it is a sensation of drowsiness and cooling of the brain: and I must say that this is an indescribably pleasant effect. Following this directly cooling effect is the refreshing action on the central nervous system, which I regard as the most distinctive action of the cold bath. The excitation experienced by the sensitive nerves from the low temperature of the bath is at once transmitted centripetally, and acts to a greater or less degree on the important nervous centres. The lowered excitability of the brain is raised, and from the refreshed centre goes out a fresh innervation of the circulation, respiration, digestion, tissue change and of the motor apparatus. The effect is a restful sleep, a clear sensorium, a fresher look, active movements, and a surprising desire for food.

To speak more particularly of these effects, and beginning with the *improvement of digestion*, it must must be said that there is not only an increased desire for food, but what is taken is more perfectly digested than before. This shows that there is an increased secretion of the digestive fluids, which is probably to be ascribed only to better innervation. We can in this way feed the patient very differently; and this is of great importance in long-continued fevers, such as typhoid. The *circulatory apparatus* receives its waves of excitation from several sources: by way of the reflexes, a direct excitation from the cutaneous vessels, and finally the excitation of the heart muscle from the cooled blood circulating through it. The succession of phenomena is as follows: The first perceptible action of the bath is the contraction of the peripheral vessels (often to the extent that the pulse disappears), so far a direct action; then increase of blood-pressure and overfilling of the vessels in the internal organs, and after a time relaxation of the peripheral vessels and invariable persistence of the high blood-pressure. The heart works slowly and forcibly, the vessels show an improved tension, as recognized by the decrease of dicrotism and the return of the elasticity-elevation.

The *respiratory apparatus* is excited by the peripheral irritation to deeper and slower movements. The improved sensible innervation of the mucous membrane supplied by the vagus causes reflex cough, by which collected secretions are thrown off. In this way the formation of bronchial obstructions, atelectasis and catarrhal pneumonia, is better avoided than by the usual advice to turn the patient on the side from time to time; a recommendation which I think purely theoretical, since, on the one hand, a typhoid fever patient cannot remain on the side for

a long time, and, on the other hand, the former conception of the mechanical origin of hypostatic pneumonia is, in my opinion, very faulty. What is necessary is, not lateral decubitus, but deep respiratory movements with expansion of the lower and posterior portions of the lungs, and the normal sensibility and excitability of the bronchial mucous membrane, so that the collection of mucus and the consequences of bronchial obstruction, atelectasis and catarrhal pneumonia, will be avoided.

The *visible secretions*, the urine, the saliva, tears and sweat, are increased by the bath treatment. The tongue is moist, the eye is bright, and the skin is soft and supple.

Finally, the *favorable action on the trophic spheres* is shown by the non-appearance of bed sores, etc. Besides the trophic innervation the conditions of the circulation (blood-pressure, rapidity of the circulation and vascular dilatation), also play an important part here.

The *form*, *duration* and *temperature* of the water-treatment is determined by the indications of the individual case. The complete bath must be regarded as the most effective, convenient and pleasant form of hydrotherapy; in this all experienced observers are agreed.

The temperature of the water and the duration of the bath are regulated by the stage of the disease, the height of the temperature, the quality of the heart's action, the condition of the nervous system and the general constitution of the patient. We may say generally, the more recent the affection, the higher the temperature, the more resistant the heart and nervous system, and the stronger the constitution, the colder and longer is the bath, and the more frequently is it to be repeated. Very low temperatures for the bath have been lately discarded by the greater number of authors, and it is seldom that a temperature lower than 65¾° is used. In most cases I use baths between 72.5° and 86°, according to the individual constitution, though in early cases, with strong constitution, baths of 63.5° to 65¾° are frequently given. The bath at the temperature of the room is very pleasant. The patient is placed, as often as necessary in twenty-four hours, in the same water, this being renewed only in the morning. As a rule, however, a temperature of 65¾° is too low.

The average duration of the bath should be from fifteen to twenty minutes. The number of baths in twenty-four hours varies according to the intensity and resistance of the fever, between two and six; I seldom use a larger number. We can best determine when the bath is to be renewed, by the temperature. Brand's recommendation to bathe when the axillary temperature reaches 103.1° must be criticised as routine practice, but as a rule it is correct. Frequently there are cases in which we must order the bath when the temperature reaches 102.2°, and other cases in which we do not, or generally do not, bathe even at 104°. In my opinion the reaction of the patient after the first bath is an important point, and this is best determined by the condition of the nervous system, the pulse, and by the subjective condition. Of course the effect on the temperature of the body is very important, but this is not the only thing to be considered; some constitutions are but little affected by cold baths, though they are again and again desired because they are refreshing, give a good pulse, and are followed by sleep, while the temperature is lowered only slightly and for a very short time. In other cases, especially of nervous constitution, the action of cold baths is often unsatisfactory. True, the temperature goes down for a few hours 3.5° or 5°, but the patient feels uncomfortable, chilled, and has not the desired refreshed sensation.

You must consider that in private practice attention must be paid to the subjective sensation of the patient, and to the sentiments of his friends, and you must always use the mildest measures when it can be done without injury to the effect desired. The miserable condition of a patient for an hour after a too cold bath, and the frightful appearance which he presents, will not add to your reputation. And the bath has here failed of its purpose, since we wish a refreshing, an enlivening action on the nervous system, not depression or shock. For twenty years, therefore, I have recommended for private practice the gradually cooled bath, and I can now most highly recommend it after an experience with thousands of cases of typhoid fever and other infectious diseases.

The patient is placed in a warm bath of 90.5° or 86°—this is always 14° or 18° below the temperature of the body, and in proportion to it is still to be considered cool—and then the water is continually poured over him with the hands or a large sponge. While this is being done cold water is very slowly poured in at the foot of the bath-tub, and thus the temperature of the whole bath is gradually lowered to 77° or 72.5°, until the patient's teeth clatter, or he declares that he cannot stand it colder. The patient must now remain in the bath as long as possible, say fifteen or twenty minutes. He is then taken from the bath and placed on a blanket, previously warmed, and he is wrapped in this without being dried. In this he remains in the greatest comfort for a quarter of an hour, when he is rubbed dry, clean linen put on, and he is allowed to sleep.

By this form of bath we have entirely in our hands the degree of reflex action desired, and at the same time as a measure of the amount of action we have the objective state and the subjective feelings of the patient. The cooling of the blood by the gradually cooled bath is not less, though the sensation of shock is absent, than by the very cold bath, because the bath can be kept up as long as desired. And I think it better to fall a little short of our purpose by the use of the warm bath than do too much by the cold bath. In regard to the individual expressions of physicians who do not recommend the gradually cooled bath, I can only attribute them to insufficient experience. But I can say that every physician who, like myself, has had personal experience with the different forms of baths, both on patients and himself, will endorse the luke-warm and gradually cooled baths.

Warm baths of 90.5° to 95,° though not much below the normal temperature of the body, are never-

theless 12° or 14° below the fever temperature, and while the reduction of temperature is not inconsiderable, it is insufficient, and the reflex action is very slight. The warm bath is therefore especially suitable for those cases which the older physicians described as febris nervosa versatilis, cases which have the character of irritable weakness to a marked extent. Such cases, in which the infection so frequently shows a malignant character — we see them in measles, scarlet fever and small-pox as well as in typhoid and other affections—bear the shock of a cold douche or a cold bath very badly as a rule, at least at first; and the subjective and objective actions of tolerable warm baths seem therefore praiseworthy. A sleep after the bath is especially important, as by it the brain has a rest which it obtains in no other way. When the extremely irritated nervous system has been quieted to some extent we can very soon follow the warm with the gradually cooled bath, and even with baths at 77° or 72.5°.

It would of course be very wrong to have the same bath-temperature for every case and for every stage. Individual indications are here very necessary in order to obtain the proper effect. Not only do different constitutions and different conditions of infection need very different temperatures and forms of baths, but the temperature of the bath should vary a great deal in the course of the same sickness. In the case of a weak, nervous woman who comes under your care in the second week of a neglected typhoid the condition of the nervous system, of the temperature, pulse, etc., will show that you can only use warm baths of 90.5° to 95,° and perhaps add a short douche or a wet-sheet. If the action on the pulse, temperature and nervous system is satisfactory, the bath temperature on subsequent days may be lowered to 86°, and later even to 77°, with from four to five baths a day. But in the third week, when there are spontaneous morning remissions, two or three baths of 90.5° may be given each day.

The indications for the temperature, frequency and duration of the bath also depend upon the needs of the individual case. *The sum of the symptoms, the whole clinical picture and the influence upon it of the first baths, but not the effect on the temperature, should alone serve as guides.*

As regards the cold douche I may remark that a short and not too cold douche in the warm bath may be tried in severe asthenic forms of the different acute infectious diseases, and is often well borne. This is especially the case in those infections whose course is rapid, as scarlatina or small-pox, and in which all therapeutic measures must be carried out in a few days.

The simple wet pack probably cannot be considered as having much of an antipyretic effect, as its temperature is very soon raised to that of the body. Ice bladders, of which we make various uses, have a marked local cooling effect, but the effect on the temperature of the body is inconsiderable. They are therefore less serviceable for antipyresis than for antiphlogosis, as in combatting pneumonia.

In regard to the value of the antipyretic drugs, I think that the opposition to them has gone too far. The more recently discovered substances of this class excel the former both in a more certain antipyretic action, which is almost without unpleasant accompanying effects, and in the much smaller dose required. As for the individual drugs, my experience is that the earlier ones, quinine, conchinine, salicylic acid, hydro-quinone, resorcine, and others, are surpassed by antipyrin, thallin and antifebrin. Antifebrin is superior to antipyrin and thallin both on account of its more certain effect (which is almost entirely free from unpleasant accompanying effects), and on account of the smal! dose necessary as well as its cheapness.

Of the methods of using these drugs, of their principal and secondary effects, I will speak more particularly in the lecture on the treatment of typhoid fever.

ORIGINAL ARTICLES.

PNEUMATIC DIFFERENTIATION AND THE PNEUMATIC DIFFERENTIAL PROCESS. ITS DEFINITION AND GENERAL SUGGESTIONS FOR ITS APPLICATION.

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(*Concluded from page 512.*)

Recent research has simplified our classification of phthisis. Certainly as far as indications for treatment are concerned, the all imporatnt question to decide is, when does a degenerative process in the lungs become tubercular? We know that two conditions are necessary: 1. Susceptibility or soil. 2. Impregnation and germination.

The writers in the earlier part of this century recorded the clinical evidence of the liability of even the simplest bronchial catarrh to become an uncontrollable phthisical degeneration. They also recorded percentages of recovery due to what we can now ascribe as due to a continued residence in an aseptic atmosphere. It is possibly true that the bacillus of tuberculosis may find its way into the animal economy through the stomach or by the abraded mucous or cutaneous surfaces. It is absolutely sure that a tubercular person in an ordinary dwelling, theatre, church or closed vehicle, will contaminate the air to such an extent that his companions and neighbors will respire his bacilli-laden breath. All of the factors that prevent germination in such exposures are not understood, but *vital resistance* is the term that thus far conveys the answer. The ability in the subject to establish and maintain the normal equilibrium between carbonic acid and oxygen, and the intelligence and intuition with which we are endowed, lead us to acts of involuntary protection. We are told by sanitarians that the sleeping-room should be the best ventilated room in the house. In many cases tuber-

cular susceptibility is primarily instituted by persistent pulmonary indolence.

In a condition of robust health, the fatigue of the day's exertion, mental or physical, produces relaxation of our nervous energies; our respiratory power decreases, both in inspiratory length and expiratory force; we have a resultant increase of carbonic acid in our general circulation and of course in the medulla and pons, at such a time we grow sleepy, and such a condition is made manifest by our awkward attempts of revival by "gaping," and with the deeper inspiration of this act we succeed for a time in revivifying the sluggish medulla and through it the pneumogastrics, but in a short time and for the same reason our respiration becomes superficial and again we gape, until finally we retire, sleep rapidly supervenes and should we observe the phenomena of the respiration we would find the highest expression of normal breathing. The inspiratory act becomes long, deep and forcible. The air is fairly aspirated into the thorax; the expiration is short, and in the sound sleeper the vibrating nares hardly remit their sonorous rattle before the hungry lungs are again impelling the air with a faithfulness that nothing but their supreme function could demand. Sleep is "nature's great restorer" when conducted in compartments with unlimited supplies of pure air. Recent experiments prove that bacterial germs which are inevitably introduced into the air cells through the polluted air of seggregation, are annihilated by the voraciousness of the tissue cells with which they come in contact when the *vital resistance* of the cell is at the standard of health. Normal sleep then may be a virtual antiseptic process.

It is probably true that the lungs of every man, woman and child in this city have almost daily visitations from circumambient microbes. The bacillus of tuberculosis is no small minority of the sum total, but so long as the lung tissue is maintained at its normal point of *vital resistance*, the bacillis are innocuous. Pulmonary indolence is the first step to susceptibility.

From such insidious causes down to the most sthenic inflammation that may attack the lung itself we have every gradation of power whose sequential direction is the destruction of the vital resistance. The soil is now ready, impregnation takes place, germination follows; the bacilli seize upon the stagnant lungs, invade the guarding tissue cells, gain an entrance into the blood and lymph channels and the citadel is at once in a state of siege.

From this brief outline it is plain to be seen where we must direct our treatment. I have referred to the indications for treatment in most of the simpler conditions that lead to the graver septic pathological conditions. I will now refer to that department of my subject which treats of *topical medication*.

First, is it possible? One can hardly study the mechanism of the human body and fail to discover the evidence of adaptation of ends to means. We have only to discover the function of a given part or section, when we shall surely find no bungling mechanism that permits or compels its perfect action. We are not to forget that the inexorable laws of physics find their supremest expression in the constant and ceaseless activity of our living organism. Mr. Joseph Ketchum, by a process of synthetic reasoning reached the conclusion that in respiration there must be a difference in size of the breathing aperture between inspiration and expiration before he informed himself that such a provision had been made in the physiological function of the glottis. The theory he advanced in his article upon "The Physics of Pneumatic Diffentation"[1] seems to have been unchallenged, and while it may be possible to supplement the function of the glottis, the ability to condense vapor upon the interpulmonary surface must depend upon the conditions which he clearly indicates. More than this, a close study of the function of the glottis will show that its proper action is an essential, even indispensable condition to life. In the varying humidities, temperatures and densities of our atmosphere, and in many vocations, a continually placid glottis would drown us in a moist atmosphere, or parch and crack our inter-bronchial mucous surfaces in a hot dry atmosphere. This can be shown by the behavior of the glottis in the Russian bath, where the glottis remains wide open during expiration. The respiration of dry air will cause the glottis to contract during expiration, thereby retarding the outflowing air, and keeping a sufficient amount of moisture upon the mucous surfaces. It would seem that the terminal nerve filaments which convey centric impressions from the glottidean region, are rendered obtund by moisture and the reverse by dryness. It is needless to refer to the comprehensive action of the glottis when upon a full inspiration, it is instinctively closed to effect the expulsion of abdominal contents.

In studying this unique mechanism we find it of far more importance than physiologists have ascribed to it; and to maintain its healthy action or to supplement it is the key note to the question of topical medication. I have shown how by forced inspiration and inspiratory differentiation it is possible to convey spray and vapor deeply into the pulmonary structure. It remains to describe such other means within our control as will surely condense saturated air in interpulmonary spaces and cavities.

This contemplates the principal act of the entire differential scheme, viz: Respiratory differentiation. In this act with a variation of, say one inch Hg. from minus to plus, the weight of the normal air with each inspiratory and expiratory act, we are now compelling the circulation of a corresponding increase in complemental air in the complete respiratory act. There must be in this act an assertion of the power of the physiological action of the glottis, as described by Mr. Ketchum in his study of the mechanism of the inspiratory act; but let us see how this may be supplemented.

The patient makes a full inspiration through the ordinary capacious breathing tube, breathing a saturated vapor for temperature and density of air, with the assistance of one inch Hg. minus the weight of normal air *i. e.*, rarefaction. Now, with this act, we have our ordinary quantity of inspired air, plus the complemental saturated air. At this juncture, had

[1] Medical Record, Jan. 9, 1886.

we the physical, or especially the expiratory strength, we could by closing the glottis, and making a violent expiratory effort condense our interpulmonary complement of air; but we are contemplating a measure for the cure and relief of diseased, not healthy humanity. Taking our patient, then, with his lung fully permeated with saturated air (a position he can maintain with comfort for a longer time than if furnished with his ordinary inspiratory force), we will now call upon him to give us his full expiratory power, at the same time giving him the assistance of say one inch Hg. plus the weight of the normal air *i. e.*, compression in the cabinet. We will do more —it will be remembered I said he made his inspiration through a tube of sufficient capacity to produce no obstruction to the inflow—now by the use of the artificial reversible glottis, we will restrict his expirations to a point impossible for him to expire in sufficient time, and with sufficient comfort to maintain his existence without the assistance above described. Now then, a force of one-half pound pressure per square inch is being exerted about the superficial area of the lungs, and upon the saturated air therein. This air is restricted in its outflow to a degree which will admit of the dynamic value of pressure in producing compression of the interpulmonary air, and at the same time permit a comfortable and sufficient respiration. Respiration may thus be carried on for an indefinite period with the absolute assurance of the deposition of a fixed quantity of condensate upon the interpulmonary surfaces and air containing cavities. This condensate may be increased by heating the vapor to the limit of tolerance and probably safely by covering the thorax with refrigerant bags of salt and ice. I think then, that I have demonstrated that topical application is possible.

Secondly, is it feasible? Whether feasible or not it has been the goal for unlimited professional want and endeavor. I am practically acquainted with the means hitherto within our control by which we have hoped at least, that effectual topical medication was produced. Whatever of scientific basis there may be for such a hope, the fact remains that spray introducing inhalers, nasal and oral appliances have long been used, and constitute in the estimation of many an essential element in the management of phthisical cases.

It is essential to distinguish in this connection between spray and vapor. By the forced inspiratory act, it is inevitable that the small particles of the medicament are given an impetus that carries them deeply into the interpulmonary structure; and where cavities are formed which communicate with the larger and adjacent bronchi, it is equally inevitable that agents in the form of spray can be deposited therein. When spray is finally subdivided or nebulized, such portions may the more easily spring into vapor when the atmospheric variations and temperature will permit. These variations may be found in the contrasted temperatures of the external and the interpulmonary air, and I have already referred to the means by which this can be increased; I have in other papers and discussions pointed out the evidence of the introduction of agents into the general circulation, and to those who have grown skeptical either concerning the power or the desirability of thus producing local and general medication, I especially appeal for calm judgment, lest the failure to produce a salutary effect may be as much the result of an ill chosen remedy as the possibility of its non-application. It is idle to adduce argument to prove that every professional man knows, ether, chloroform, nitrous oxide, etc., are, strictly speaking, vapors. We know that their action depends upon the fact of their entrance into the circulation through the pulmonary avenue.

Every substance is capable of being vaporized, and though those thus far supposed to be possessed of germicidal power, are of a lower specific gravity than ether or chloroform, the deficiency can be counterbalanced by bringing them to their vaporizing point before use. But in a therapeutic sense we are by no means restricted to moist agents. Chemically dry air, the various gases and smoke, may more fully suit the pathological necessity. In the selection of dry agents, respiratory differentiation, with restricted expiratory aperture should be used, for the compression so effectual in squeezing the moisture from saturated air, will as effectually disseminate air and its dry contents into such communicating bronchi and vesicles as would resist the ordinary respiratory current, and the diffusion dependent thereupon. When primary infiltration is a tubercular deposit or a neoplastic growth, of course the pulmonary structure at the seat of such disturbance has become pathological and impervious to air. It is not in the province of this paper to theorize on the etiology of tubercle, or to present such facts as may go to show the possibility or impossibility of clearing up such a deposit by any treatment medicinal, climatic or mechanical. It is my conviction, nevertheless, that any demonstrable area of lung tissue which is tubercularly infiltrated must forever remain so, or else softening, ulceration and excavation must take place. It is with a full realization of such a probability that I would urge the unremitting use of antiseptic vapors, for the purpose of circumscribing the area of deposit by rendering the contiguous lobules sterile to the bacillic germ. Ulceration and breaking down may take place. Here it is of paramount importance that antiseptic vapor be not only introduced, but forcibly introduced to secure a more thorough evacuation of the ulcerated area. It has been my good fortune to see recovery take place by such a chain of pathological and therapeutic events.

In fibrous degeneration of the lung, tubercular infection does not supervene as rapidly or as constantly as in the prodromal catarrhal inflammations. One reason for this may be that the cells of the hyperplastic tissue are as voracious for the bacilli as the normal histological tissue cells. True fibrosis of the lung is a chronic change that will resist every effort to restore its function, but such patients have normal lung tissue left, or they would not be alive, and it is the gradual involvement of these healthy areas that finally gains it the mastery of the subject. Judicious and occasional treatment with such agents

as act as emollients to the intercurrent congestions and catarrhs will save lung tissue, prolong life and render existence comfortable.

It is in these cases that over zeal in frequency, force and duration of treatment may work harm, and in the judgment of competent observers $\frac{4}{10}$ to $\frac{6}{10}$ inspiratory differentiation from five to ten minutes, once or twice weekly, will gain them all the benefit to be derived. Where respiratory differentiation is chosen $\frac{3}{10}$ to $\frac{4}{10}$ excursion is sufficient.

Little further need be said concerning the various forms and manifestations of phthisis. While the several forces of the differential process at our command enable us to manipulate and adapt the treatment that advanced disease demands—in other words to treat it—the supreme importance of bringing our skill and energy to bear at a time of more equal warfare is manifest. Nothing that experience has shown to be of benefit should be omitted, and in so far as this may apply to the dietary or as a means for the preparation for climatic sojourn, the skillful administration of pneumatic differentiation will be found a potent auxillary.

For the general manipulation of phthisis I would advise the following: *First*, residual air expansion, repeated once or twice; *Second*, respiratory differentiation with artificial reversible glottis, restricted expiratory aperture, from five to ten minutes; *Third*, the sitting may be concluded by inspiratory differentiation. In early phthisis with prolonged expiration, forced inspiration with high rarefaction one to two inches through a constricted inspiratory inlet, may be interspersed with the last act. Treatment conducted in this manner, will in a few inspirations lower the rarefaction in the cabinet. When it has reached $\frac{6}{10}$, inspiratory differentiation can again proceed; spray can be used with the forced inspiration, and the condensation of such of it, as springs into vapor may be produced by compelling the patient to make an expiratory effort through a constructed expiratory outlet, but such act is exhausting and unnecessary when the respiratory act is used. In respiratory and inspiratory differentiation spray, vapor, antiseptic gas, or air, should never be ommitted; *Fourth*, Cogwheel respiration and prolonged expiration may be treated by respiratory differentiation with artificial reversible glottis with constricted inspiratory and free expiratory aperture—(The patient simply reversing the artificial glottis in the breathing tube); *Fifth*, the duration of treatment and the length of each sitting must depend largely upon the character of the disease, and the evidence for good or evil that is gained as the case proceeds.

The acute affections will rarely require more than from two to six daily consecutive applications. Cases that demand correction of faulty development, weekly or bi-weekly expansion, covering a considerable period of time. The same for anæmia, chlorosis, amenorrhœa, sleeplessness, anorexia and assimilative deficiency.

In early phthisis daily treatment from ten to twenty minutes should be given until all adventitious sounds disappear, the sputa free from bacilli or absent altogether. The treatment can then be relaxed, but such patients should be cautioned to present themselves occasionally for inspection and treatment. This provision is as imperative as to command them to report for consultation upon the advent of any symptom which they themselves recognize as demanding treatment.

In the diagnosis of early phthisis we must have the courage of our convictions. To temporize with one small râle, to allow our sympathy and generosity to explain away a symptom like a slight hæmorrhage or a persistent anæmia, or pallor, or loss of weight, is a breach of faith as flagrant as any error we can commit.

In chronic phthisis treatment should be given daily for a week or ten days, then tri-weekly, bi-weekly and weekly, and covering a long period of time, perhaps for months and even years. As sad a mistake as can be made is to promise too much, or to allow a patient of this class or his friends to hope for an absolute restoration to health. If such a happy result is attained it can be accepted with good grace by all concerned, but opportunities for infinite good may be lost by promise or hope of impossible accomplishment. Such cases do not require the extremes of pressure and rarefaction as the earlier and acute cases. The value of climatic treatment is indisputable, but with such means within our control the failure to prepare the patient's lungs for the full advantage of any particular locality would seem as absurd as to send a man with purulent ophthalmia and conjunctivitis, to view the beauties of an art gallery, or the grandeur of a summer's sunset.

Sixth, primary hæmorrhage must be treated by inspiratory differentiation. *Seventh*, *Medication*. In the choice of agents much must depend upon our knowledge as therapeutists. While it is undoubtedly true that sedative and emollient agents will allay the excess of bronchial catarrh in chronic phthisis, there is nothing so ethereal about pulmonary tissue that shall prevent it from responding like the other tissues of the body to well chosen antiseptic agents. The general tendency in the profession now is to discard polytheraphy, and especially in the conservative measures of antiseptic surgery; and if we are to indulge the hope of the discovery of an efficient germicide against the bacillus of tuberculosis, we must select single agents and follow them to the finish. Where such agents are vaporized as by Dr. McCaskey's vaporizer[2] their doses must depend upon their point of air saturation, but when projected by spray they must bear a certain per cent. of the solution sprayed. Glycerine, cosmoline, and agents of like specific gravity make a seductive spray, and perhaps in appropriate conditions an effective one; but for a pure antiseptic effect we are not to forget that impure glycerine, the sugars and oils may be efficient cultivating mediums for bacterial propogation, and if successfully impelled into pulmonary spaces may make a rich pabulum for the microbe we are seeking to destroy.

[2]Dr. George W. McCaskey, of Fort Wayne, Ind., an earnest colaborer in this work, has devised a vaporizer, whereby we can keep a cubic foot of air saturated with the vapor of any agent. An article descriptive of this will shortly be presented to the profession by Dr. McCaskey.

How far this may apply to moist agents of any description can only be determined by careful and continued study. If we are to reason from analogy or to act on the hints that we gain from the study of climatic treatment, we must primarily conclude that cases that should do well in warm, moist atmospheres of southern climates will do well with antiseptic vapors and spray; while those cases that should show improvement in cold, dry climates would best respond to dry dehydrating agents. The range of medication being so thoroughly under our control, it must require as good judgment and discrimination as by internal medication. I have found a hint in treating some cases, by changing as much as possible the character of the air from that in which the disease developed, and I have further found preliminary course of cabinet treatment to materially aid me in the selection of climate for individual cases. While the rapid improvement that has supervened upon a climatic change, after a preliminary course of pneumatic differential treatment may be ascribed to the effectual expansion thereby induced, I am sure I am warranted in my conclusion that a measure of the benefit is due to thorough disinfection of the lungs and the evidence gained of the patient's tolerance of moist or dry air, as the case may be.

I will mention a few of the most important agents that I have thus far used: Dry air, this can be easily furnished by attaching an U tube to the breathing faucet, and packing the tube with pumice stone and pure sulphuric acid; or absorbent cotton borated or mercurialized may be loosely packed in the tube.

The bichloride of mercury in solution of a strength of $\frac{1}{500}$ to $\frac{1}{2000}$.

Lugol's solution 10 to 50 per cent.

Creosote 10 to 50 per cent.

Pure carbolic acid 10 to 50 per cent.

In using the last two agents I have projected the spray with the "Semple Inhaler," using equal parts of pure glycerine and water as diluents.

Oxygen gas and the per-oxide of hydrogen may be appropriately applied. I am now using C. P. glycerine as a de-hydrating and disinfectant spray.

As emollient and sedative applications I have used morphine, cocaine, atropia, stramonium, and a weak emulsion of peppermint oil.

It is unnecessary to make further reference to special agents. The list is as extensive as the materia medica, and as in other departments of medicine, each practitioner will find certain agents to behave better in his hands than in those whom he seeks to instruct, yet as there is probably but one best way to do everything, it is equally probable that there is but one best bacillicide and one best opportunity for its perfect work.

450 Classon Avenue, Brooklyn, N. Y., April 26, 1887.

BERGEON'S METHOD OF TREATING PHTHISIS BY GASEOUS ENEMATA.

Read before the Chicago Medical Society, April 18, 1887.

BY FRANCIS J. CRANE, M.D.,

OF CHICAGO, ILL.

In January last, the *N. Y. Medical Record* contained an article headed "A New Treatment of Phthisis," which gives a brief outline of Dr. Bergeon's method of administering carbon dioxide mixed with sulphuretted hydrogen gas, and referred to an article published in the *British Medical Journal*, of December 18, 1886. This described in full the apparatus and mode of using it, and stated they had been procuring beneficial results by the method, and that Professor Cornil, of Paris, had also become an enthusiastic supporter of it. This led me to write to Dr. Bergeon, and in the course of my correspondence, he presented me with an apparatus, as well as with the treatise of Dr. Morel read before the French Academy last June, and also one by Professor Cornil. These are so exhaustive that I have embodied in this paper only the essence of both, as follows:

New treatment of the diseases of Respiratory Organs and Septicæmia by the means of Gaseous Enemata according to M. Bergeon's Method. By Dr. V. Morel. It would seem from the statements of physicians who have tried either to prevent the development or the proliferation of the bacillus, or to destroy it, that it is the one thing which we have to overcome in the treatment of phthisis. In reasoning by analogy with other contagious diseases, as, for instance, cholera and hydrophobia, it might be urged that the bacillus is not the immediate cause of the morbid phenomena of tuberculous affections. It is known that, aside from miliary tubercles, which invade the lungs and are the cause of the patients' symptoms, the gravest phenomena of phthisis are due to the septicæmia, which poisons the patient, and is caused by the suppuration of the tubercles, which, brought in contact with air, undergo putrefaction and are absorbed into the system. The bacillus' work, then, by producing lesions of texture, which become fatal to the organism by rapidly destroying or, by undergoing softening and absorption, produces septicæmia. To use Darembourg's expression: "The bacillus is nothing, but septicæmia is everything."

In acknowledging that it is not necessary to ascribe to the microbe all of the morbid phenomena of phthisis, it is not less true that its presence is to the organism an incessant and real danger, and that consequently, in endeavoring to discover a remedy for the lesions which it has produced, it is necessary to destroy it, or at least to neutralize its action. For this purpose such agents as sulphuret of hydrogen, bisulphide of carbon, and other antiseptics mixed with pure carbonic acid, are employed.

Principles of Bergeon's Method.—The first mode of treatment thought of consisted in applying by inhalation some substances having parasiticidal properties. It is known that antiseptic substances are poisonous when introduced into the arterial system, either directly or by inhalation. Claude Bernard has

shown that poisonous gases introduced into the arterial system through the lungs produce toxic effects almost instantaneously. Besides, the antiseptic substances have an irritating action, and this action, operating on diseased lungs, will only increase the existing lesions, while their unpleasant odor aroused a refusal in the patients to their use; this is probably the reason why so little success has been obtained by inhalation in the treatment of phthisis, and is conclusive proof that the introduction of antiseptics by the stomach is preferable, for Cl. Bernard has shown that when a poisonous or medicinal substance is introduced into an organ distant from the arterial system; into the digestive tract, for instance, it cannot enter the arterial system, because it is expelled before reaching it. It must pass through the portal system, the hepatic veins and the pulmonary texture, there to be exhaled, or it can be expelled in the liver with the bile.

It is well established by experiments that the introduction of poisonous substances into the digestive tube may be done without danger by taking certain precautions, of which the most important consist in not injecting too large quantities at once, and not injecting more before the first has been completely eliminated. What avenue ought to be chosen? The stomach or the rectum? In both cases, the medicament will have to pass through the portal vein, the liver, the hepatic vein, the right heart and pulmonary arteries, but we think the rectal way is preferable, for the patient cannot take a dislike to the antiseptic substances on account of their disagreeable odors.

Gaseous Enemata in the Therapeutics of Respiratory Organs, Pulmonary Phthisis, Asthma, Whooping-cough, Bronchitis, Bronchiectasis, Bronchorrhœa, Pulmonary Catarrh. By M. Cornil.[1] The principle of the action of gaseous infections and of their rapid elimination by the lung, has been given by Cl. Bernard. He showed that when sulphuretted hydrogen is injected into the rectum of an animal, the gas is expelled by the lungs; he proved that we can so inject it in almost unlimited quantities, without causing harm; whereas its introduction by inhalation rapidly occasions grave accidents and the animal's death. However, to introduce sulphurous hydrogen, or any other gas or vapor, into the economy per rectum, for the purpose of destroying the microorganisms which exist in a number of diseases, it was necessary to find a gaseous vehicle, inoffensive to the economy, and easily tolerated by the bowel.

Carbonic acid gas admirably answers the purpose; it is very easily borne by the colon, rapidly absorbed and afterward expelled by the lung, with the medicinal gas which it holds. This gas itself, in all probability, plays a very important part in this new treatment of pulmonary diseases.

Dr. Bergeon, who inaugurated this method, published a few months ago the first results obtained in the treatment of pulmonary phthisis by this method. Physicians of Lyons, Paris, Geneva and Marseilles who have treated phthisis by the method, have generally obtained a very rapid disappearance of the phenomena of pulmonary suppuration, and a progress towards a state of health with all the signs of cure.

Concerning the patients I have treated by this method, I can now assert that the results I predicted three months ago have been achieved. The patients that I considered cured have no more expectoration, and give on auscultation stethoscopic signs which denote the presence of quiescent cavities, or cicatrized lesions. Some of these patients have been obliged to return to a life of labor; nevertheless their respiratory organs have stood the test, and the amelioration obtained has been permanent.

While many patients whom the expectoration once so exhausted, now have only 3 or 4 grams of sputum a day, at the beginning of the treatment it was from 250 to 300 grams. We have found bacilli, it is true, in the sputa of these patients; yet it remains to be discovered whether these bacilli which continue to exist after the return to health have kept their functional activity or not. Whatever may be the mode of action of carbonic acid introduced by intestinal absorption in the venous blood and afterward expelled by the lung, it can be said from the observation of patients, that this gas, filled with proper medicinal substances, greatly modifies the respiratory function, and makes the hæmatosis more complete and easy. It gives a sensation of well-being, followed by an increase of strength and weight, a diminution of fever and night sweats.

The following precautions must be observed in giving this treatment: 1. The CO^2 ought to be as pure as possible, so as not to inflame the bowel. That obtained by the reaction of dilute sulphuric acid on the bicarbonate of soda has always been perfectly absorbed by the bowel without producing any toxic effect.

2. The gas should be collected in a receiver from which the air has been expelled.

3. Make the injections just before a meal, or at least three hours after, and never when the patient is weary. It is necessary to be very cautious in experimenting with other medicinal substances, for if, although the sulphuretted hydrogen is inoffensive, other agents, as turpentine, chloral, ammoniæ, iodine, bromine, ether, etc., may not be, and might be the cause of an inflammation of the intestinal mucous membrane.

It is not necessary that the dose be large; by injecting twice a day 4 or 5 litres of carbonic acid gas passed through 500 grams of sulphur water, we rapidly notice the disappearance of all the phenomena of pulmonary suppuration, either in its acute or chronical state.

Bergeon's method has been successfully experimented with by Dr. Chantamesse, in his service at St. Antoine Hospital, during the months of August, September and October. The following are his results: "Two patients brought to the hospital suffering with violent attacks of asthma were, half an hour after the injection with sulfo-carbon vapors, entirely relieved of the dyspnœa. The treatment having been continued for a few days, the breathing was relieved, and the attacks were not repeated during the time they remained." Nine patients giving general

[1] See THE JOURNAL, January 15, 1887, p. 69.

and local signs of pulmonary tuberculosis, with tubercular bacilli in the sputa, have obtained very great amelioration from this treatment. The increase of weight has been rapid, one pound and sometimes as much as 35 oz. a week; cough and expectoration have largely ceased. We always find the bacilli in the sputum, however. These patients have been under treatment for one month and a half. One of them has increased nine pounds in weight.

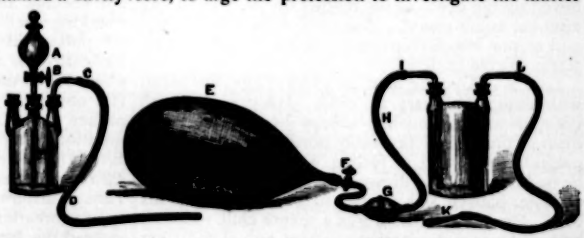
I have used this treatment with four cases; two of phthisis, one of intussusception of the bowel and one of spasmodic croup. With the croup and intussusception it operated like a charm, overcoming both almost instantly. In the case of croup, I used the bisulphide of carbon, and in half an hour the little patient was sleeping, apparently as well as ever.

Case 1.—Mr. W., aged 26. Two sisters and a brother died of phthisis; he had been treating with various physicians and changing climate (having been to Colorado twice) for over three years. The right lung was nearly useless, as it contained a cavity corresponding to nearly if not quite half of its original capacity. Nowhere on this side could vesicular respiration be heard, while the left apex likewise yielded unmistakable signs of disease. There were œdema of the feet, incessant cough, broken sleep, watery stools and ravenous appetite, although he could not retain anything on the stomach; temperature 102° F. After the first injection of bisulphide of carbon, given in the evening, he slept well for three hours and was bothered very little with cough, but on rising in the morning, to use his own words, came nearly strangling for want of a cough, which he finally got, and expectorated a pint with the one paroxysm. I then used the sulphuretted hydrogen water and he improved very fast; in one week he had a normal temperature; night sweats almost entirely stopped, expectoration was much less, and he was able to wear his shoes, which he had not been able to do for over six weeks. Unfortunately, however, at the latter part of the second week he ventured out in one of our rainy March days, took cold, and his death, two days later, cut short the record of what might have proven almost a miracle.

Case 3.—Mrs. W., aged 34, widow, having lost her mother and older sister from phthisis, applied to me for some heart trouble. Complained of a dizzy sensation on rising from a recumbent position; feet swollen some, hectic flush, considerable dyspnœa, slight cough with no expectoration. *Diagnosis:* Incipient phthisis with heart complication? She had noticed also, for about a week some night sweats, which did not last, however, after the second administration of gas. She improved so rapidly that she only made seven visits in all, and pronounced herself cured. There is, however, no doubt but she will have a return of symptoms upon the slightest provocation.

This comprises all my experience, but these are facts, and facts are stubborn things to deal with. In regard to the best mineral water, I wish to say that, after trying the Lafayette, Ind., the Blue Lick, Ky., and the Ypsilanti, Mich., mineral waters, I am satisfied that the Ypsilanti mineral water is just what we want. It contains 20 cubic inches of gas to the gallon, and is so strongly impregnated with it that I use it over the second time by having solid rubber corks to replace the perforated ones when I have got through using the apparatus. Mr. St. Clair, President of the Company at 88 Randolph St., has kindly furnished a case of 12 quarts of the water, which I have forwarded to Dr. Bergeon, in hopes that it will compare favorably with the Eaux Bonnes water which he is using. I have had an apparatus made by E. H. Sargent, of Chicago, which I think takes the place of Morel's very well, differing from it only in point of cheapness, costing but a little more than one-half the former.

The true place of this mode of treatment cannot be established until the experience of careful observers has been given us, years hence. I wish, therefore, to urge the profession to investigate the matter



fairly, since time, I am confident, will prove that Dr. Bergeon has been one of the greatest benefactors of the age.

UNUSUAL METASTASIS IN MUMPS,

With Report of Three Fatal Cases.

Read before the Loup Valley District Medical Society, April 7, 1887.

BY F. D. HALDEMAN, M.D.,

OF ORD, NEBRASKA.

The epidemics of mumps which are of frequent occurrence in almost every community, present some points of interest to which it may be well to refer. But little attention seems to be given in medical literature to the consideration of this disease. Aitken, in his "Science and Practice of Medicine," three volumes of over 3,000 pages, devotes *one page* to its consideration; and that monument to the progress of medical science, Pepper's "System of Medicine," containing about 5,500 pages, devotes less than six pages to the subject; J. Lewis Smith, in his work on the "Diseases of Infancy and Childhood," of over 800 pages, devotes *two* pages to this subject; and yet it is one of our most widely extended and frequently recurring epidemics.

Mumps, as it prevails under the usual conditions, does not possess a high degree of importance, even

when metastasis to the testicle takes place. Under some conditions, however, it develops an intensity of action which is quite unknown to the ordinary course of the disease. During the winter of 1886, mumps appeared as an epidemic in and about Ord; not many children escaped, and a good proportion of adults were attacked. Among the latter were an unusual large number of metastases, and cases of violent and even alarming general derangement. From January 1 to May 20, 1886, there occurred in my practice twelve cases of metastasis in mumps. Out of this number, one died from metastasis to the right lung, and one had serious heart trouble, but recovered, as did the remaining ten cases. Two more fatal cases occurred near Ord, about the same time, under the care of Dr. Klinker, who has kindly given me the history of these very interesting cases. One was metastasis to the liver, causing abscess which opened into the right lung, producing death; and the other was metastasis to the uterus, producing death of a seven months' fœtus and premature labor, followed by the death of the mother on the second day after her confinement. A record of these fatal cases, and of one which recovered, I think of sufficient interest to give in detail.

Case 1.—A young man, 28 years of age, was taken with mumps February 25, 1886. His general health previous to this time had always been good. The disease progressed favorably until March 1, when patient complained of feeling weak and worn out; he had been up and dressed every day, and did not consider himself sick enough to be confined to his bed. On March 2 there was a severe chill, followed by high fever and sweating; patient not able to get up. On March 3 I saw the case for the first time. There was slight swelling of both parotids; left testicle tender and about twice its natural size; temperature 103, pulse 90, respiration 30. Face flushed and the skin bathed in perspiration; frequent and suppressed cough, accompanied by a scanty expectoration of glairy mucus; decided dulness on percussion over the lower lateral and posterior part of right side of chest; crepitant râle heard below the axilla of the same side; tongue coated with a light fur and bowels constipated. I directed poultices to be applied to right side of chest and sweet oil to the testicle; gave a powder of calomel and jalap to move bowels, and gr. viij doses of quinine were ordered to be given every four hours.

March 5. The swelling in both parotids had entirely disappeared; left testicle not so much swollen, but still very tender on pressure; temperature 104, pulse 110, face flushed and profuse perspiration; respiration 40, expectoration still scanty and streaked with blood; percussion and auscultation showed an increase of dulness over the right lung, with mucous râles in that region; tongue coated. The bowels had moved freely the day before; urine scanty and high-colored. The same treatment was continued, and in addition egg-nogg was ordered.

March 7. Patient's condition much worse. He was propped up in bed, as it was impossible for him to lie down. Temperature 106, pulse 150 and very weak, respiration 50 and difficult. Skin bathed in sweat; increased area and degree of dulness over right lung, with mucous râles; retention of urine; tongue covered with a dark-brown coat. Patient became unconscious; respiration more frequent and difficult; expectoration abundant; countenance livid and swollen. He gradually sank into coma, which deepened until it ended in death at 1 A.M. March 8.

This was evidently a case of embolic pneumonia, referable to the parotitis. The minute emboli, derived from the veins of the affected glands, charged with putrescent matter, being arrested in the branches of the pulmonary artery, excited a circumscribed pneumonia which caused a fatal termination.

Case 2.—On May 16, 1886, I was called to see Mr. J. V., a married man, about 28 years of age, whose prostration and general appearance indicated alarming illness. I was informed by his wife that he was taken with mumps on May 5, and seemed to be getting along all right until May 10, when the swelling began to leave the parotids and the testicle became the seat of trouble. His condition did not become alarming until May 13, when he had a sinking spell with pain over the cardiac region; the pulse was irregular and feeble. A physician was called in, and treated the case until May 16, when I was requested to take charge of the case. His condition at this time was as follows: The surface of his body was cold and drenched in perspiration; temperature 97°, pulse 50, small and intermitting; the heart's action was confused and feeble. Auscultation revealed a distinct mitral murmur. Though inspiring deeply, he seemed to suffer from apnœa, breathing hurried and anxious, but the air entered the lungs freely. There was no pain, but great agitation and feebleness, intellect clear. Both testicles were slightly swollen and quite tender. No enlargement of the parotid glands. I prescribed quinine, digitalis, and acid sul. aromatic; applied sweet oil to the testicles and ordered egg-nogg or milk-punch to be given frequently. The pulse became more regular, and his general condition gradually improved. The temperature remained below normal until May 18. The heart difficulty subsided after a few days, and patient was able to be up in two weeks. There was slight atrophy of left testicle, but no other bad results remained.

The metastasis to the heart, producing endocarditis, is an event much to be dreaded, and was caused in this case by septic infection of the blood.

Case 3.—Is one of the cases which occurred in the practice of Dr. Klinker, and the record given to me is as follows: Mr. N., aged 21 years, had an attack of mumps which dated from January 13, 1886. Both parotid glands were affected, and five days afterwards both testicles became tender and swollen. On January 19 the swelling in both parotids began to subside and a feeling of weakness, with a tendency to syncope, followed; that evening he had a chill, and soon afterwards a high fever. On January 20 Dr. Klinker was called, and found his temperature 103°, pulse 120 and very weak, profuse perspiration, pupils widely dilated, tenderness over liver with constant pain in that region; tongue coated with a light fur; *partial paralysis* of right upper and lower ex-

tremities. Did not see patient again until January 23. The temperature at this time was 104°, pulse 130, profuse perspiration, with hurried breathing; right hypochondrium tense and painful on pressure, very distinct jaundice; the paralysis had changed to the left upper and lower extremities. The right thigh became very much swollen at this time, and an abscess formed, which was not opened.

January 26. Patient semi-conscious, and breathing with great difficulty. During an effort to cough, there came a large gush of dark purulent matter which filled the mouth, throat and lungs so as to produce immediate death by suffocation.

Case 4. Mrs. D., 20 years of age, in the seventh month of pregnancy. She was taken with the mumps on April 1, 1886. April 5 the swelling suddenly left parotid glands, and she became very nervous and weak; complained of pain over the hypogastric region. Dr. Klinker reports that at this time her temperature was 104°, pulse 120 and feeble. There was pain and tenderness over the womb, with constant vomiting. Her fever continued high throughout her illness.

April 10. Active labor pains set in, and she was delivered of a seven months' fœtus, which had evidently been dead several days. The placenta came away, and with it a very profuse and *offensive* discharge. The patient became delirious, and died April 12.

I find in looking over the literature of this common disease, that metastasis to the œsophagus is mentioned by Dr. Richard McSherry, of Baltimore, Md.; to the kidneys by Dr. Croner, of Berlin; and deafness coming on during an attack of mumps has been recorded by Dr. A. H. Buck, of New York. Dr. H. V. Logan[1] gives the record of a very interesting case, in which there was double metastasis, and subsequently thrombosis occurred in most of the superficial veins. The left parotid and right testicle were involved at the same time; twenty-two days afterwards the left testicle became involved, and on the fortieth day of his illness inflammation of the right parotid gland set in. These facts indicate the serious nature of the disease, and, as I have already shown, there may be various other complications which are to be very much dreaded. There are no other examples of metastasis so complete and satisfactory as that of mumps, and bearing in mind that both testicles are not unfrequently inflamed during an attack of mumps, it seems very probable that, in many cases, the infectious material enters the circulation and, in passing through organs having a very complex circulatory apparatus, is apt to be arrested and give rise to more or less disturbance.

That mumps is a contagious as well as infectious malady has long been known, but what the nature of the contagium was, has not been so well understood. Dr. A. Ollivier, Physician to the Children's Hospital in Paris, has made some researches with a view of ascertaining the correctness of the results previously obtained by Drs. Capitan and Charrin, who had been occupied in the same line of research. Like these two experimenters, Dr. Ollivier discovered in the different liquids of the body, but principally in the blood and in the urine of patients suffering from mumps, micrococci of a special form. These results were constantly obtained in patients suffering from mumps. Similar researches were made on children in health, and the results were absolutely negative; a fact which shows that there is something specific in the disease under consideration. As it has been shown that the development and propagation of mumps is due to the presence of micro-organisms, it should be considered as an infectious or contagious malady, and should therefore be classed with measles, scarlet fever, small-pox, etc.

[1] Medical News, May 27, 1882.

[*Note*—Since preparing the above report, I have met with a case which shows the importance of this subject, and one of the mistakes likely to occur as a result of complete atrophy of the testicle following mumps: While in Omaha last month I was in the office of Dr. W. S. Gibbs, of that city, when a patient came in who had just met with an accident. It seems that, during an attempt to lift a ladder, he felt something give way in his right groin, accompanied by severe pain and faintness. He was taken to a physician who after an examination, found a tumor in the right inguinal region. After an ineffectual effort to reduce it, and finding that there was only one testicle in the scrotum, he pronounced it a case of partially descended testicle. The patient not being satisfied and suffering intense pain, came to Dr. Gibbs's office. We found a tumor the size of a walnut, and about as hard, lodged in the right inguinal canal; there was only one testicle to be discovered in the scrotum. After inquiring into the history of the case, we found that during boyhood he had the mumps, with metastasis to the right testicle followed by complete atrophy of that gland. The diagnosis of inguinal hernia was then made clear. Dr. Gibbs succeeded in reducing it, after passing his little finger to the seat of stricture at the neck of the sac, and by a process of tearing enlarged the opening sufficiently to allow the strangulated intestine to pass back, when he employed gentle taxis.]

My principal object in this paper has been to call attention to the seriousness of the results frequently attending these epidemics. No doubt some of the many pages of medical literature devoted to diseases which a busy practitioner might not see once in a lifetime, might profitably be given to the discussion of this most common ailment. I have availed myself of every material source of information within my reach, and deeply regret that more has not been published in an accessible form, to aid us in meeting the many indications which are frequently present in this common malady.

MEDICAL PROGRESS

PYRIDINE IN ASTHMA.—DR. WYSS, of Geneva, in *Der Fortschritt*, No. 1, January 5, 1887, commenting on the treatment of asthma with pyridine, writes: The physiological and therapeutical properties of pyridine was investigated by Professor G. Sée. His pupil, Dr. Dandien, recently published the results of his researches on pyridine and allied basic substances (collidine,) and draws the following therapeutic conclusions: 1. The pyridine is indicated in attacks of angina pectoris. Its effects are very rapid. Its use prevents other fits. 2. In asthma, be it of nervous, emphysematous, or catarrhal nature, in the pathological as well as in the symptomatic asthma, the effects of pyridine are superior to those of injections of morphia; they are of longer

duration, and perfectly devoid of dangerous consequences. Moreover, pyridine is not merely a palliative, but really a curative remedy. 3. It is equally indicated in asthmatic attacks brought on by inhalation of poisonous gases. 4. Its beneficial effects are improved in dyspnœa of bronchiectatic and and tuberculous patients, and in dyspnœa in consequence of laryngeal affections. There is no contra-indication against the use of pyridine. Its absorption and elimination by the urine being very rapid, no accumulative effects are to be apprehended. Germain Sée gives the following directions for its use: 4 to 5 grammes (about 4 scruples) are poured into a small plate and placed in the midst of a room of 25 cubic metres. The patient, sitting in a corner of this room inhales the volatilizing pyridine mixed with the air. In urgent cases the pyridine may be directly inhaled by pouring four to five drops of it on a pocket handkerchief, which is held before the patient's mouth and nose. Further independent observations will prove whether the properties of the pyridine bear out the extraordinary praise with which Dr. Dandien extols the efficacy of this remedy. The great drawback is the strong, disagreeable smell, reminding of rotten fish, of the slightly yellowish fluid, which will not be easly concealed. Dr. Wyss adds: I tried the pyridine in only one case of a female patient, suffering many years from asthmatic attacks, in which the remedy had unmistakably a beneficial effect. The patient, aged 44, has since December 16, regularly, daily, three inhalations of pyridine, and has since been free of fits; whilst, before resorting to this remedy, she suffered at least twice a week from very severe asthmatic attacks.—*London Medical Record*, Feb. 15, 1887.

ACTION OF PYRIDINE ON THE FUNCTION OF RESPIRATION.—In health and in disease, says SILVA, (phthisis, pleurisy, chlorosis, etc.,) inhalations of pyridine have the effect of diminishing the quantity of air respired in a fixed period of time; sometimes by 500 cubic centimètres, sometimes even by 2,000 cubic centimètres, according to the time the inhalation is given. Notwithstanding this, the feeling of need of air diminishes. The respiratory curve shows that in the healthy man pyridine produces at first an expiratory dyspnœa; the respiration then becomes less frequent, irregular, preventing true periods and sometimes long intervals of apnœa. After the inhalation the respiration remains less frequent and less full, with deep inspirations. Sometimes sleep intervenes, and the periodic respiration is then more evident. The inhalation always causes abundant salivation, preceded by a bitter taste in the mouth and roughness of the throat, with constant desire to spit; the nose also runs. The respiratory curves obtained by exciting the nostrils by the faradic current are very similar to those obtained by pyridine. The nose runs, there is salivation, expiratory arrest, the respiration is disturbed and becomes sometimes periodic, and lastly, after the excitement has ceased, there are the occasional deep inspirations, and those periods of apnœa as seen after the inhalation of pyridine. But sleep and the sense of less need of air are wanting. The author therefore believes that pyridine acts on the respiratory centre by means of the trigeminus chiefly, but that the pneumo-gastric also is affected. The influence of pyridine on the pneumo-gastric is also shown by the increased secretion from the bronchial tubes. Pyridine therefore produces irritation of the terminal nasal fibres of the trigeminus, and hence running off the nose, salivation, and expiratory dyspnœa. The action on the bulb by means of this nerve is evident, and the respiratory centre is first stimulated and then paralyxed. This is shown by the diminution of the quantity of the air respired, and by the respiration becoming periodic and superficial. But the action of pyridine is not limited to the respiratory centre in the bulb, but also extends to the higher centre of the cortex, since it produces sleep; and this again contributes to give a periodic type to the respiration and to diminish the quantity of air respired in a given time.—*Loudon Medical Record*, Feb. 15, 1887.

ATROPINE INJECTIONS IN HÆMOPTYSIS.—The subcutaneous injection of atropine in cases of hæmoptysis was recommended by Tacke in 1882, and Dr. Hausmann, of Meran, has found it to be a most successful means of allaying recurring hæmorrhage from the lungs. (*International Klinische Rundschau*, No. 5, 1887). The great indication is to allow of the formation of a thrombus in the bleeding vessels, as Traub explained, by diminished blood-pressure. The capillary pressure will be lowered when the smaller arteries have their calibre lessened; hence the use of digitalis, restricted diet, and rest. Reflex vaso-motor constriction may also be assisted by astringents or the application of cold. In chronic (and passive) cases iron is recommended. Ergotine, turpentine, morphine injections, and alcohol are favorite remedies. In passive hæmorrhage from congestion some recommend wine, walking about, and deep respirations; in active hæmorrhage, only rest, ice, and morphine. But there are cases which resist all these measures, and in these Dr. Hausmann has found hypodermic injection of atrophine wonderfully efficacious. The following examples are given: 1. A patient with cavities in both lungs had hæmoptysis twice daily for six days to an alarming extent. The hæmorrhage was then arrested by a hypodermic injection of 0.3 milligramme of atropine ($\frac{1}{210}$ grain nearly). After two months the hæmorrhage recurred, and was only arrested by recurrence to atropine. 2. A patient at San Remo was troubled with hæmoptysis all through the winter of 1884, in spite of every care, and it only desisted in the summer. Next winter at Meran he was again similarly affected for a long time, till two injections of atropine (of the same strength as above) arrested the attack altogether. 3. In October last year Dr. Hausmann at once stopped severe hæmoptysis in a lady who had been treated in vain for eight days by ergotine injections, turpentine, etc, The quantities of atropine recommended for hypodermic injection in cases of profuse or moderate hæmorrhage from the lungs, which resist other means of treatment, vary between 0.2 and 0.5 milligrammes ($\frac{3}{1000}$ grain to $\frac{7}{1000}$ grain.)

THE
Journal of the American Medical Association.
PUBLISHED WEEKLY.

The Editor of this Journal would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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Per Annum, in Advance.....$5.00
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Address
Journal of the American Medical Association,
No. 65 Randolph Street,
Chicago, Illinois.

SATURDAY, MAY 14, 1887.

THERAPEUTICS OF THE UPPER AIR-PASSAGES.

How far are the topical measures at present employed in the treatment of the diseases of the upper air-passages, excluding those of a surgical nature, efficient and worthy of confidence? Such was the question discussed before the New York Academy of Medicine on April 21; and the fact that the question was brought up for discussion shows that there is some doubt in regard to the favorable influence of our measures upon the local diseased conditions of the upper air-passages. The question was discussed by Drs. F. H. Bosworth, Andrew H. Smith and W. H. Thomson.

Dr. Bosworth takes the ground that when we knew little about the treatment of diseases of the upper air-passages our machinery was very extensive; but now that we finally obtain striking success in the management of these diseases he thinks he may safely say that all the machinery necessary might be carried in a small hand-satchel. As regards topical applications to the larynx, in the early days of laryngology, did any of them, asks Dr. Bosworth, ever do any good? In his opinion, in the whole history of laryngology no case of so-called chronic laryngitis was ever cured by topical applications; and as regards the more serious affections no one ever claimed that topical applications could cure them. "The condition called chronic laryngitis is merely symptomatic and secondary to disease of the nasal cavities in every case. The morbid condition is not an hyperæmia with hypersecretion, to be corrected by an astringent, but rather a perversion of the normal secretion of the part, due to the morbid lesion above." He takes the view that there is no such condition as naso-pharyngeal catarrh in the sense of its being a catarrhal inflammation of the vault of the pharynx. "This disease, which is supposed to consist essentially in an excessive secretion from the vault of the pharynx, due to chronic inflammation of its lining membrane, is a myth. This excessive secretion is in reality diminished secretion. It is a normal secretion from a healthy membrane, but undergoing subsequent change as a result of disease in the part above." Astringents are not indicated here, but some method which reaches the cause or course of the disease, which is situated in the nasal cavities.

In such conditions in the vault of the pharynx as hypertrophy of the pharyngeal tonsil, acute or chronic inflammation, neoplasms, or other diseased conditions consisting in structural changes the indications are for surgical treatment; local agents have no other than a palliative effect. Nor is nasal catarrh a hypersecretion, to be cured by the application of astringents; at least it may be said that even if it is a hypersecretion the whole list of astringents has been tried in vain. "The symptoms of so-called nasal catarrh are due to those morbid conditions of the nasal mucous membrane which interfere with the great respiratory function of the nasal passages—namely, exosmosis of serum. Furthermore, the so-called catarrh of the pharynx, larynx, and trachea are merely secondary to this condition, and not diseases in themselves, being amenable only to treatment directed to the real seat of the disease—viz., the nose."

From his point of view, then, the treatment of catarrhal affections of the upper air-passages consists in the treatment of the nasal passages—which involves the restoration of these passages to a normal condition by the removal of obstructing bone and cartilage, reducing hypertrophied membrane, and correcting hyperæmia or other morbid conditions. It consists in use of the snare, the saw, the knife and the cautery. And of these Dr. Bosworth prefers the cautery.

The views taken by Dr. Andrew H. Smith are somewhat different from those just mentioned. In regard to the doubt as to the efficacy of our methods of treating these affections, this does not exist for Dr. Smith as regards acute and subacute affections. In chronic cases he holds that surgical treatment cannot take the place of local treatment, "and that, when surgery has done all that it can do, there still remain nearly three-fourths of the chronic throat and nose cases for the treatment of which we are dependent mostly upon medicaments applied to

the diseased surfaces." Dr. Smith's statistics are taken from the report of a large throat clinic, in which it is seen that of 1351 cases 370 operations were performed. But it is not very probable that two or three times this number should have been operated upon? Is not much of the difficulty met with in treating these cases unsuccessfully due to non-interference (surgically)? "Under the most favorable circumstances," says Dr. Smith, all we can do toward promoting the resolution of an inflammation is to assist the reparative efforts of nature." But how much, if any, reparative effort is nature making in these cases?

Dr. Thomson begins his paper with the statement that in his opinion, "the treatment of chronic diseases of the upper air-passages should be directed chiefly by two principles: first, by taking cognizance of cutaneous nerve associations in the causation and in the perpetuation of inflammations of mucous membranes; and, second, local disinfection. We know that many persons with chronic mucous catarrhs are affected by external influences which are entirely inappreciable by persons in health, and can detect a draught of air, as from a keyhole, which would be unnoticed by a healthy person. For this weakness, or irritability vaso-motor tonics are needed; and Dr. Thomson knows of nothing which will compare with the local application of the cold. The cold douche to the nape of the neck on rising, care being taken that the hair of the back of the head is not even dampened by the water, and cold salt-water sponging of the throat, according to him, are measures which should be kept up for months together, in all affections of the upper air-passages. But why take care not to dampen the hair? Washing the hair every morning is a measure of cleanliness; why do away with it? When reaction from the douche is established, he says, and the skin is dried, the entire surface of the front and back of the neck and of the root of the neck, and then of the back of the shoulders, ought to be well rubbed with sweet olive oil, to lessen the tendency to perspiration, or at least to check the chilling effects of rapid evaporation of the perspiration. The sensitive surface must then be protected by special covering—the patient should even sleep in woolen night shirts and between woolen sheets. During the day a perforated buckskin shirt should be worn over the light woolen undergarment.

It is in the direction of local disinfection that Dr. Thomson looks for the greatest progress in the treatment of diseases of the upper air-passages, except, of course, in those cases dependent upon malformations, which must be treated surgically. It may be safely said, he thinks, that as pus can be prevented only by excluding germs, so all chronic mucous inflammations can be got rid of only by excluding the presence or preventing the activity of germs. This possibly may be done by improving the resisting power of the tissues, and by using the disinfectants directly; remembering in regard to the latter point, that pure ocean or mountain air is the best disinfectant, and disinfectants of the carbolic acid class probably next best, except for necrotic affections, in which the chlorine class is better (chlorine, iodine, bromine, and sulphur).

PHYSIOLOGY FOR CHILDREN.

In the *Century* for April is an article on "English as She is Taught," by that man of humor and good common sense, Mark Twain. It consists mainly of answers to questions put to pupils in public schools, and gives a very good idea of the mental training received by children in obtaining what is called "an education." It shows, in other words, the folly of filling the minds of children with fragments of subjects which they cannot understand.

Amusing as is the article, it would be more so did it not have the sad side—did it not show how much growth-force, how much brain and nerve force, how much physical strength, are actually wasted to no purpose, and dwarfed. And while reading it we are constantly reminded that adults, "children of a larger growth," are but too often carried on in the same stream, into which they are thrown in childhood, to a ripe age of miseducation. It clearly shows the truth of what has been so often said: the child, or the pupil, must first be made to see, and then to understand what he sees. Space will not permit us to notice more of the article than that containing the answers to the questions on physiology; and from these answers we can readily imagine how the subject was taught—very much as it seems that chemistry (and physiology) is taught in many academic and medical schools.

The first answer, while not sufficiently comprehensive, is fully as clear as some that we have seen: "Physillogigy is to study about your bones stummick and vertebry." The next shows that hygiene is receiving no little attention in the schools: "Occupations which are injurious to health are carbolic acid gas which is impure blood." Dermatologists must henceforth know that "We have an upper and a lower skin. The lower skin moves all the time, and the upper skin moves when we do." We must admit

that the child was not far from the truth who said that "The body is mostly composed of water and about one-half is avaricious tissue." Old as is the science of human anatomy we are constantly learning something new; it has remained for an American child to discover that "the stomach is a small pear-shaped bone situated in the body"; that "the gastric juice keeps the bones from creaking"; and that "the salivary glands are used to salivate the body." The child who gave the following had most probably had a recent séance with the dentist: "The growth of a tooth begins in the back of the mouth and extends to the stomach." Our ideas as to the functions of the cranial nerves must be revised if it be true that "The olfactory nerve enters the cavity of the orbit and is developed into the special sense of hearing."

"If a laugh is fair here," says the author," not the struggling child, nor the unintelligent teacher—or rather the unintelligent Boards, Committees, and Trustees—are the proper target for it. All through these answers one detects the signs of a certain probable fact—that a large part of the pupil's 'instruction' consists in cramming him with obscure and wordy 'rules' which he does not understand and has no time to understand. It would be as useful to cram him with brickbats; they would at least stay." We may also detect another very probable fact: that the teacher has made vain attempts to give instruction in what he himself does not understand. "Isn't it reasonably possible," says Mr. Clemens, "that in our schools many of the questions in all studies are several miles ahead of where the pupil is?—that he is set to struggle with things that are ludicrously beyond his present reach, hopelessly beyond his present strength?" It seems so.

MANIA FOR NOVELTIES IN MEDICINE.

Probably there is to be found no period in the past history of medicine, characterized by such an active strife for making new discoveries, not only in the prolific realm of bacteriology, but in new therapeutic inventions and in novel applications of old remedies, as is the present. The mania for discoveries and inventions and the thirst for novelties has become fairly epidemic. It is only necessary to invent some kind of apparatus and either some new remedy or some new combination of old ones, apply them to the treatment of a few cases of some dangerous form of disease, or, still better, to disease in such stage of advancement as had been regarded hopeless, and report some striking improvement, before time enough has elapsed to make permanent results possible, and it is at once heralded as a grand achievement. It is so important that it cannot wait for the slow circulation of the medical press, but quickly reaches the profession and the public simultaneously through the daily secular press and telegraph. And now comes the strife between the ambitious doctors to be first in the field with the new remedies, and if the more considerate would like to delay until more reliable results could be possible, their patients speedily compel them to fall into line, or abandon them for those who have succeeded in first becoming armed and equipped for the new method of miraculous healing, until the manufacturers are hardly able to supply the needed materials.

It makes no difference whatever, whether the morbid conditions to be cured are lungs containing one hundred suppurating cavities varying from the size of a pea to that of a hen's egg, and the mucous membrane of the bowels ragged with ulcerations, if a temporary improvement can be maintained for two or three weeks, it is sufficient to constitute the subject of another favorable report, and give an additional impetus to the strife. And yet, as inexorable time moves on just as many thousands of dollars have become invested in the new materials, and the hopes of many thousands of invalids have been revived, the stubborn fact remains, that cancers will not soften and disappear under the influence of condurango, nor a continued fever flee *for good* from a cold bath or a dose of antipyrin, nor a half disorganized lung be reproduced, good as new, in three or four weeks by the magic influence of gaseous enemas. The many medical friends who have written for our *candid* opinion of the value of the Bergeon treatment of consumption, as well as those who are intending to write, may gather from the foregoing our answer; which is, that it is a method of treatment as capable of doing harm, unless skilfully used, as it is of doing good; and that from the known pathological and anatomical changes involved in all the varities of pulmonary phthisis, it is not possible to determine the real value of this or any other method of treatment until a much longer time has elapsed.

PROFESSOR ZIEMSSEN'S LECTURES.—The lecture by Prof. Ziemssen which opens this number of THE JOURNAL is the first of a series of lectures on various subjects, which will appear at short intervals during the next nine or twelve months. Our readers will be pleased to know that we have completed arrangements by which we will publish them from

advanced sheets. Among others the lectures will include the following subjects: "Subcutaneous Blood-injections, Saltwater-infusion and Intra-venous Transfusion;" "Cholera and its Treatment;" "Treatment of Typhoid Fever;" "Diphtheritic Paralyses and their Treatment;" and on diseases of the respiratory, circulatory, digestive, uro-genital and muscular apparatus.

PROFESSOR SENN'S LETTERS.—In this issue of THE JOURNAL appears the third of a series of letters from Dr. N. Senn to Dr. Christian Fenger. It may be safely said that no such review of foreign surgical work has ever appeared in this country as is being given in these letters, and that few men are so admirably fitted for writing up the subject as Dr. Senn. His tour includes England, France, Spain, Italy, and Germany, including the Congress of German Surgeons, recently held in Berlin. It is with pleasure that we acknowledge our indebtedness to Drs. Senn and Fenger for permission to publish these interesting and valuable letters. The letters will appear regularly.

SOCIETY PROCEEDINGS.

CHICAGO MEDICAL SOCIETY.

Stated Meeting, April 18, 1887.

THE PRESIDENT, W. T. BELFIELD, M.D., IN THE CHAIR.

PRELIMINARY DISCUSSION ON THE TREATMENT OF PULMONARY AFFECTION BY GASEOUS ENEMATA, WITH EXHIBITION OF APPARATUS.

THE PRESIDENT: During the last twenty-five years various specifics for pulmonary tuberculosis have been announced by enthusiastic physicians and have successively secured more or less attention from the profession, yet none of these has secured in the hands of others the results claimed by its discoverer. The benzoate of sodium treatment of Rokitansky accomplished nothing in other hands; the phenic acid injections of Déclat were powerless to arrest the disease in any but his own hands; the eucalyptol treatment of Roussel failed in the hands of other investigators. The latest method of treatment—that recommended by Bergeon, of Lyons, after two years' careful observation—has, unlike its predecessors, met with almost unanimous approval at the hands of those who have tried it, including physicians in the Paris and Philadelphia hospitals and several practitioners in our own city. Since the method not only promises well, but is also universally accessible to the profession, it has been deemed advisable to present the subject to the members of the Society in a preliminary discussion this evening. There will be presented communications from Bergeon, of Lyons, Bruen, of Philadelphia, as well as the experience of several gentlemen who have used the method in this city.

DR. FRANCIS J. CRANE read a paper entitled

BERGEON'S METHOD OF TREATING PHTHISIS BY GASEOUS ENEMATA.

(See page 541).

THE PRESIDENT: This method of Bergeon has been extensively used in the Philadelphia Hospital, chiefly by Dr. Bruen, who has kindly sent the following résumé of his experience with it:

The experience thus far obtained in the Philadelphia Hospital in the use of Bergeon's treatment of consumption by rectal injections of carbonic acid gas impregnated with sulphuretted hydrogen, has been highly encouraging.

In the *Medical News*, of April 2, 1887, a statement of clinical results thus far secured in my wards, was presented. These results indicated that the element of suppuration in pulmonary phthisis was usually very positively influenced. The night sweats have been controlled in twenty five cases without an exception. The temperature has been modified even in the most advanced cases, and in some instances in which the disease has been extensive it has been brought to a normal point. A peculiarity of the temperature charts seems to be an introduction of a sub-normal temperature in the forenoon. The expectoration has been lessened in all instances, and in some has disappeared. A marked impression has been made for the better on the nervous symptoms which attend the disease, and a more cheerful and sanguine spirit has followed the therapeusis.

It would seem justifiable to conclude that we have a most important therapeutic agent in the gas enemata treatment. One case of acute broncho pneumonia treated on this plan has recovered, and will be discharged from the hospital. The history of her case has been already stated in the article in the *Medical News*. Another case of phthisis with pneumo thorax under treatment for five weeks, is so much improved that the patient insists on her discharge. The râles have disappeared from this patient's chest (the pneumo thorax was local and confined to the lower zone of the right thorax), the opening into the lung has apparently closed and retraction of the chest wall is going on. This patient had been ill for a year previous to admission to the Philadelphia Hospital; the pneumo thorax was noted on admission. She has gained over nine pounds of flesh, expectoration has ceased, sweats abolished. The cough, however, continues as a modified symptom, since she is as yet merely a case of phthisis in stage of arrest, the bacilli of tuberculosis being still recognizable in the sputa.

Two cases of commencing phthisis with moist râles, dulness of percussion, harsh breathing, deficient expansion over right upper lobe, and tubercle bacilli in sputa, have recently been placed under the treatment. In these cases the gain in one week has been most material. The râles have disappeared

and the patients express themselves as benefited. The method of treatment is surely worth a careful scientific investigation.

In our hands a solution of 5 grs. sulphide of sodium and 5 grs. chloride of sodium in 22 ounces of water has proven the most satisfactory substance to produce the sulphuretted hydrogen. A solution more strongly impregnated with sulphuretted hydrogen has not only been more advantageous, but seemed injurious, apparently inducing palor, loss of appetite, and in some cases, irritation of the bowels. The gas should be introduced slowly, not less than half an hour seems requisite for each séance. From three to five quarts can be introduced in most cases, a gain in the tolerance of the necessary distension of the bowel being rapidly acquired. The absorption of the gas from the bowel is very rapid and in half an hour the distension will entirely subside. It is sometimes introduced more rapidly, but the gain is in proportion to the time consumed in giving the gas. The carbonic acid can be pumped through the solution containing the sulphuretted hydrogen by the acid of a ball with valve attachment, and a circular received from Paris mentions an apparatus made by Shet, 79 Rue Phillippe de Girard, on which an indication is placed to register the flow of carbonic acid. A convenient apparatus is now furnished by Evans, 1104 Chestnut St., Philadelphia.

We have not obtained as yet satisfactory results from the examination of urine, or breath, nor of the effect of the treatment upon the bacillus of tuberculosis.

EDWARD T. BRUEN, M.D.

1814 S. Rittenhouse Sq., Philadelphia, April 11, 1887.

DR. R. H. BABCOCK: My experience with this remedy is rather limited, but it seems to me there are several questions which should be considered in speaking on this subject: *First*, is the treatment safe? *Second*, is it applicable in all cases? *Third*, is it a cure? I have already answered these questions in an article in THE JOURNAL which appeared last Saturday (April 16). Practically the treatment is safe under the precautions which are laid down, but Dr. Osler in some remarks before the Philadelphia County Medical Society, narrates a case in which the patient almost succumbed after the first treatment, the gas being charged with a mixture of bi-sulphide of carbon and sulphuret of hydrogen. We can also conceive of cases in which, on account of limited respiratory power, the rapid administration of the gas by producing distension of the large bowel would seriously embarrass the limited respiratory capacity remaining in the patient. It is also conceivable that an undue amount of distension in cases of tubercular ulceration of the bowel might be dangerous, possibly producing rupture and peritonitis; and it seems to me this is a consideration which would render us cautious about administering this treatment in typhoid fever. I have had no experience and seen no reports of cases of this disease treated in this way. In regard to its applicability in all cases; that has been partially answered in considering the previous question. It has been the experience of Geneva physicians, as reported by M. Wiss, and of De La Roche, of Lyons, that there are cases which cannot tolerate the treatment at all. One patient who had hæmorrhoids suffered from such colic that the treatment had to be abandoned. Wiss also mentions a case which the treatment has to be abandoned in the course of a month, although superintended by Bergeon himself. I was asked to administer the treatment in a case in which the lungs were so extensively destroyed that it seemed to me unwise to administer it, though perhaps a small amount of gas might have ameliorated the symptoms; but had it been possible to abate or arrest the disease, the patient could certainly not have lived with such a small amount of lung left. Of course this consideration is one which renders the indiscriminate use of the treatment hazardous. There are cases in which the recovery. or arrest of the disease has been so complete that the patients are practically well, and have been able to return to their advocations. However, if we are to estimate this thing by the disappearance of bacilli from the sputum we must say it is not a cure. No case is reported in which bacilli have entirely disappeared. As you know, M. Cornil has instituted a number of experiments on animals with reference to this question, a solution of which we are all looking for with much interest. French physicians are experimenting with a great many other substances.

I am now using the treatment upon two cases, one is bronchitic asthma, but the treatments are too few as yet for me to make any report; I would not wish to say whether the relief that has been obtained is due to the treatment or is merely a coincidence. Another case is a lady aged 34, who has been suffering from phthisis for a year and a half, and who last fall received injections of phenic acid twice daily, without any improvement, who had been taking cabinet treatments from me for six weeks, without improvement, in whom the right lung is extensively consolidated, with a large cavity; in this case the relief for the first week was certainly very surprising. The patient gained in strength and experienced a feeling of well being, or as she expressed it a clearer feeling in her head, a feeling of brightness which she had not had for weeks. She certainly coughed less and expectorated less at a time. Her stools had been clay colored in spite of everything I could do; at the end of a week they were of a natural color. The movement of the bowels was perfectly natural, her tongue also cleaned off in a remarkable manner at the end of five days. The treatments were continued at my office twice a day, and the patient had to come into the city so the improvement was perhaps not quite as great as if she had taken the treatment as home. The second week she did not do quite as well which I attributed to the quality of the mineral water. At the end of two weeks she was improved in respect to all the symptoms which have been related this evening. The night sweats had ceased, her temperature was lower, but not normal—it ranged from 99° to 100¾°. I took her temperature at 9, 11, 2 and late in the afternoon, and the highest she had with the exception of once was 100¾, it was repeatedly 98¾. Her tongue did not remain clean, and her appetite did not improve as I

desired. She gained strength, but there was a complication, tubercular laryngitis, quicker than she would otherwise have done. M. Bergeon states decidedly that tubercular laryngitis has been very greatly improved by this treatment. In the case just mentioned the laryngeal symptoms have improved, but whether entirely due to the treatment I am not prepared to say, as she has had various sprays and one topical treatment to the larynx. Her case is somewhat discouraging owing to the extent of the disease since it is not entirely confined to the right lung. She has complained of no unpleasant symptoms since the first treatment when she complained of a slight burning at the anus and a desire to evacuate the rectum. Once or twice she complained of a little colic. She is now taking the treatments at home and feels very much encouraged, but the outlook to me is not what it should be. I saw her last Thursday, and I felt disappointed to learn that she is beginning to perspire again.

I think all the precautions have been taken in this case thus far, and it proves that the treatment does not give rapid improvement in all cases, and and the fact cited by Wiss, that out of four cases treated in Geneva all died within three months, shows that it does not cure in all cases. However, it is a treatment which is so admirable and furnishes such good results in many cases, that I think all physicians are justified in trying it. Another thing which recommends it is that after the patient becomes accustomed to the treatment it can be handed over to a trusty member of the family to administer. Compared with pneumatic differentiation it offers a much better chance for the improvement of the patient, although there are cases in which pneumatic differentiation will do what this will not. But thus far this method gives better prospects of benefiting a number of cases than any method which has been placed before the profession.

DR. W. H. WEAVER: A case under treatment at the Chicago Policlinic, which is making favorable progress, is one in which there is no doubt of the extent of the tuberculosis in the left upper lobe. The expectoration was quite profuse and contained an abundance of bacilli. She has been failing for two years, but very rapidly for two months. She had fever, night sweats, prostration, wasting loss of appetite, but had not taken any medicine of any sort. She came to the Policlinic dispensary where I treated her; the first time giving her an injection of only one pint of gas. Her temperature that day was 101½; the next day she returned and I gave her a quart injection and her temperature was then $102\frac{6}{10}$; the next day, the third injection, her temperature was normal and I gave her another quart. When she returned for the fourth injection her temperature was normal and she seemed better in every way; said her appetite had returned, the cough was less severe, expectoration diminished greatly, and the night sweats almost entirely relieved. At the fifth injection she had a slight temperature, she said she had had no more chills and fever for the last three days. I used a solution of about 5 grains of sulphide of potassium with 5 grains of common salt in about 20 ounces of warm water, which gives about the proper amount of sulphuretted hydrogen gas, at least the patients all say that they feel better and have no unpleasant symptoms. I have given it in three other cases, one has some pelvic trouble, and the physician who is treating her thinks that might be a counter-indication to the remedy, but she seems to be better in her general condition, has increased in flesh, and coughs less and prefers to continue the treatment. Another case of incipient tuberculosis, where the upper left apex is affected more particularly, seems to be improved considerably under treatment. He has been having the treatment one week.

DR. L. L. MCARTHUR: In starting in with this treatment of phthisis I saw the difficulties that were going to arise in the apparatus, and think I can make some suggestions that will prove valuable. The apparatus presented to-night is not portable, and if the patients are to be treated at home they would either require a separate apparatus for each patient or else one must run the risk of breaking the apparatus. In the first place, I thought of a method of collecting the carbonic acid gas, by taking one of those portable laughing-gas cylinders, to be obtained at any dental depot, to a soda-water fountain and having it charged with carbonic acid gas. There can be stored from one to 500 gallons of gas, equally chemically pure with that recommended. This apparatus would simply require the turning of a stop-cock in the tube or opening to permit the gas to escape at any rate desired. If found desirable to continue the use of sulphuretted water, instead of mixing the two gases together first, it could be done by using a wash bottle and a delivery tube. I believe an equally efficient method is to introduce into this cylinder a solution of sulphide of potassium, which furnishes for every ounce of the sulphide of potassium about a gallon of sulphuretted hydrogen. The carbonic acid formed liberates the H_2S from the sulphide introduced. The strength according to Bergeon's method is about half of 1 per cent. or a little less. By a little calculation it will be seen that the carbonic acid formed by the combination of the carbon dioxide and water would set free the hydrogen in combination with the sulphur in the definitely desired quantities, so that it would not be necessary to use the sulphuretted water. In that way the gas could be introduced into the measuring bag and then into the rectum. The cylinder would hold a sufficient amount of gas for many treatments, and as it is easily portable, it could be taken to the houses of patients and not require them to come to the office.

DR. R. TILLEY: I have had no experience whatever in this method of treatment, but I would like to say a word with reference to the apparatus which I think would certainly make the measurement of the gases used more definite. I think, notwithstanding the doctor's explanation of the number of pressures that may be necessary to constitute a quart, that one individual may require so many pressures and another so many less or so many more, and thus the amount would be somewhat indefinite; whereas if a bottle of the necessary size was filled full of carbonic

acid gas, and then another bottle with a tube attached full of water, the latter could be attached with the necessary tubes and elevated just the same as a siphon, and the water introduced into the bottle containing the carbonic acid gas and passed through the sulphuretted hydrogen water with the required rapidity, and thus it would come much more regularly than could be done by means of this spasmodic pressure of the bulb. I would like to call attention to the fact that there are on sale in this city large cylinders containing absolutely pure carbonic acid gas, imported from Germany.

DR. WALTER M. FITCH: For generating the gas we use a common Wolf bottle with three corks, one for a stop-cock for the acid, one for the delivery tube and one for the safety valve. This last must not be pressed in too tightly; at one time I had the stop-cock blown out and broken by putting in the acid a little too rapidly. To make the gas we use about a heaping tablespoon of bicarbonate of sodium, covering that with cold water about two inches deep. If we use hot water we make a suds that will foam up and run into the bag. We use the bicarbonate of sodium and sulphuric acid diluted one part in four. The reason for using the sulphuric acid in preference to any other is that, being absolutely non-volatile, none of it will pass over into the bag of carbonic acid gas. To make the gas the generating bottle is connected with the bag, which is emptied and tightly rolled in order to remove all the air. The generator should also be emptied of air by turning in some of the acid before it is connected witn the gas bag. The bags usually hold about one-half of what they are marked—a three-gallon bag will hold about six quarts, etc. If we should over-distend it the corks would be blown out of the generator. For injecting the gas the stop-cock is turned off and the bag is connected with the bubbling tube, which extends to the bottom of the bottle of mineral water, so that the gas coming from the bag may pass down into the water and, rising up through it, be medicated by the sulphur vapor which it contains. It is injected by means of a hand bulb. In using the bulb it is important to remember that, since it is intended to be used only with water, the action of the valves is not perfect with gas, and it is therefore necessary that the bulb be held vertically, so that the weight of the valves may assist in closing them. In using it in this way we secure a perfect action which draws the gas into the bottom of the bottle and delivers it through the tube. I have now connected it as it is in use. The bisulphide of carbon has been mentioned several times. In order to use this it is necessary that the gas be washed for fear that it may contain impurities, for none of the chemicals we get are perfectly pure, and as they are most likely to contain vapors of hydrochloric acid which are easily dissolved in water, the gas is bubbled through pure water to purify it. Between the Wolf bottle and the bulb is inserted an ordinary chemical drying tube, a glass tube three-fourths of an inch in diameter, which is drawn down at one end small enough to have the rubber tube slipped over it. Into the other end is fitted a cork with a glass tube through it; in the drying tube is placed a tampon of cotton, and the requisite amount usually 1 dram, of bisulphide of carbon is placed on the cotton. In passing the gas through this cotton it becomes very strongly impregnated with the vapor and is injected in that manner. I think some Philadelphia physician spoke of an instrument for measuring the gas injected. A very simple way of measuring it when using a small apparatus of this kind, is with the bulb. The bulb will deliver at each compression just so much gas; in order to measure how much is delivered we simply take a measured bottle, invert it over the water with the water filling it, then introduce the rectal tube into the bottle and remove the water from it by displacement, the number of compressions being counted. The bulbs vary in size. I remember the capacity of six now in use: two count 15 compressions to the pint; three count 20 compressions to the pint, and one counts 25. Thus, with each apparatus the bulb must be measured, and knowing its capacity, the gas can be prescribed in as definite a way as any medicine measured out of a bottle.

THE PRESIDENT: My experience with this method, extending over less than a month, comprises the observation of one case that impressed me strongly; this was a young man suffering from the last stages of quick consumption, who had been in the care of Dr. H. A. Johnson. He was very feeble, much emaciated, had badly swollen feet and albuminous urine. His temperature ranged from 101 to 103 each afternoon, and he had profuse night sweats. In addition to these usual symptoms he suffered to an extraordinary degree from laryngeal tuberculosis. He had been unable for many weeks to lie down with comfort, and according to his own statement, had not slept fifteen minutes in three months. Cough was constant and expectoration profuse. About a month before Dr. Johnson had given him three or four weeks to live. I used gaseous enemata, employing the artificial solution advised by Dr. Bruen, twice a day. Improvement began on the second day, and by the fourth day was pronounced. The cough was less distressing and the sweats and expectoration had diminished, the patient was able to lie down and sleep for two hours continuously. He was, however, so evidently near dissolution that I deemed it inadvisable to continue a tentative treatment, and stopped it on the fourth day. Two days later he sent an urgent request for the resumption of the treatment, saying that his former symptoms were returning. However, I declined to use the injections further, and six days after their discontinuance the patient died, nearly two weeks after his physician had expected his demise.

It should be remembered that these injections seem to arrest not the tuberculosis proper, but the sepsis which is secondary thereto, and that there are numerous other septic conditions in which benefit may fairly be expected, such as surgical sepsis, diphtheria, puerperal fever, etc. The apparatus furnished by the stores is unnecessarily expensive and inconvenient for a visiting practice. I use an improvised apparatus consisting of a gas bag, double perforated cork and ordinary large wide-mouthed bottle—the whole costing $2.50 instead of $10. The entire

outfit can be readily improvised at a little cost and carried in a small handbag.

My limited experience gives me the impression that the artificial solution of the sulphide of potassium is preferable to either the Ypsilanti or the Blue Lick water, because the amount of sulphuretted hydrogen in these waters as we obtain them at the drug store appears to be extremely variable, while in the artificial solution it can be maintained at a given percentage, increased or diminished as desired, yet care should be taken to make a weak solution about such as is recommended by Dr. Bruen, since a too concentrated solution of the poison may produce very unpleasant symptoms. This method can be employed by every practitioner as well as by the most expert specialist. If it will accomplish nothing more than the relief of the distressing cough, expectoration, fever and sweats of advanced consumption, it will at least do what can be effected by no other therapeutic measure with which I am acquainted; hence it is to be hoped that it will be submitted to a general test by the profession, that we may quickly ascertain exactly its merits and demerits.

DR. C. M. FITCH said that the first case in which he used the method was one of extreme anxiety to me. The patient, a young lady 20 years of age, had previously had exceptionally good health, was well nourished, with a muscular development that seemed to defy fatigue. She returned in July last from a visit to Colorado with a cough which was referred to the dryness of the climate and the inhalation of the alkaline dust, which causes a catarrhal irritation. This seemed a plausible explanation, and as the cough was not urgent, it received but little attention until, in November, she took a cold which resulted in chills for three or four successive days, and seemed to prostrate her greatly. I then examined her chest and, to my astonishment, found extensive and marked consolidation at the apex of the left lung; there was also irritation throughout the remainder of the lung and some moist râles. I was much alarmed by what I found, for the location of the consolidation made me fear it might prove something more than simple pneumonia. Several of our best physicians tendered their aid, but the case failed to improve. The patient lost flesh rapidly, her cough became fearfully oppressive and her temperature never fell to normal, rarely below 100°, and most of the time 101° and rising to 103°. She had daily chills and profuse night sweats, and the case presented all the features of acute phthisis. At the last examination, made by Dr. Belfield and Dr. Ochsner, both thought they detected bacilli in the sputum, although previous examinations had failed to show them.

Late in January my attention was called to an article in the *Medical Record*, giving a notice of Bennett's paper in the *British Medical Journal*, which contained an account of Bergeon's method. After considerable trouble I obtained a copy of the paper which contained this article, and went to Sargent's to have an apparatus made, and there learned that they had just made one for Dr. Crane, who kindly allowed me to appropriate it and ordered another for himself. Knowing nothing at that time of what we might expect in such a case from our different mineral waters, and knowing that Dr. Bergeon recommended bi-sulphide of carbon as the best substitute, we commenced treatment with the bi-sulphide, and the effect was surprising. The treatment was commenced seven weeks ago to-day; during the week previous the temperature had at no time fallen to normal; the lowest point was 100°, and once it rose to 105½°, and night sweats and chills were constant. The first time the injection was tried very cautiously, only a moderate amount of gas being used. The effect was not specially apparent; the second day the temperature still rose to 103°. That night the gas was used much more freely and with results that to us were somewhat alarming. The next morning the temperature fell to 95°, and it did not rise above 100° during the day; the cough was almost suppressed, although it had previously been very distressing. The next day we did not use the gas quite so freely, but the day following the lung was almost entirely occluded; the mucus seemed to become viscid, and the air was almost shut out from the lung. There was so little elimination of the bi-sulphide through the lung that we soon began to have marked symptoms of bi-sulphide poisoning, although in many respects she appeared better; the cough was almost gone, and there were no chills. The treatment was discontinued for about ten days, and then resumed with the Ypsilanti mineral water. From that time there has been a satisfactory improvement, and she is better than she has been at any time since her sickness began; her appetite and strength are improved, and she is evidently beginning to gain flesh; her cough is greatly lessened, and the chills have altogether disappeared. Her night sweats have been absent for six weeks, although during the last warm weather she perspired a little for three or four nights; it was not colliquative sweating, and she seems now in a fair way to recover.

The second case in which I tried this remedy seemed about as hopeless as well could be; the patient was confined to her bed, had been suffering from severe hæmorrhage, chills, night sweats, and great prostration. There was marked dulness at the apex of the right lung, and the physician who was treating her recognized softening. The husband, whose family were patients of mine, after the physician told him that nothing more could be done, came to me. I told him that I did not know that I could do anything more; the only thing I could suggest would be this new treatment which I had been experimenting with, and which might be of some value. He was anxious to have something tried, and the case was undertaken. At the end of four days this patient's chills, which had existed then about a month, ceased entirely, and have not since recurred. On the ninth or tenth day the sweats disappeared; her cough was relieved from the first, no opiate could have controlled it more completely. The expectoration was also lessened, her appetite has improved, and she is gaining in strength. In all respects I think she has gained as much in the time she has been under treatment as I ever saw a patient gain under any treatment in the same time.

Another case was a young man of scrofulous habit, who has a stiff knee from scrofulous disease of the joint. He has been under treatment about three weeks. There was marked consolidation in his case, also, at the apex of the right lung, and every indication of phthisis. He has improved materially; his cough is much lessened and he is gaining in strength. The indigestion and flatulence which had previously troubled him very much, has disappeared under the use of the gas; there has also been a great improvement in his appetite.

The other cases I have seen have not been under treatment long enough to justify me in making a report. It seems to me from what I have seen that we have a remedy that is worthy further trial. Whether it will fulfill the promise of its youth we have yet to see. I have no doubt this remedy will relieve spasmodic asthma, and there are other conditions that it would relieve. In puerperal fever I should try it, using the bi-sulphide of carbon, but using it cautiously. I also think it would be of value in malignant diphtheria and typhoid fever.

FOREIGN CORRESPONDENCE

ABERDEEN AND EDINBURGH.[1]

Alexander Ogston—Osteotomy for Pes Planum—Antisepsis in the Aberdeen Hospital—Lumbar Abscess—Fungous Osteo-myelitis of Femur—Dr. Keith—His Method of Operating—Treatment of the Pedicle—Suturing the Abdominal Wall.

Dear Dr. Fenger:—One of the principal objects of my tour through Scotland was to see in the flesh the man whose name I had so repeatedly mentioned to my class, the discoverer of the pus-microbes, Professor Alexander Ogston, of Aberdeen. While the scientific world knows but little of Aberdeen, its Hospital and its University, the name of Ogston has penetrated to all parts of the civilized world. Dr. Ogston is a man in the prime of life, tall, and handsome. Although a profound scholar, an able surgeon, and a splendid writer, he is one of the most modest men I have ever met; a good illustration that greatness is not incompatible with modesty, but rather the reverse. In my conversation with him I could not but draw a comparison between him and the average doctor in a Medical Society, who is full of experience and crammed with positive assertions. Although living in a comparatively small city, Dr. Ogston's life is an exceedingly busy one. He holds the Chair of Surgery in Marshall College, where he teaches the various branches of surgery, including otology, ophthalmology, and gynæcology; at the same time he attends to the clinical work in the Infirmary, and a large private practice. I visited with him the Royal Infirmary, a building more than fifty years old, with 300 beds, nearly one-half of which are occupied by surgical patients. Although the sanitary condition of the Infirmary is quite defective, all wounds showed that even under unfavorable circumstances good results can be obtained by strict antiseptic precautions.

One of Ogston's operations, osteotomy for pes planum, was illustrated by a number of patients in the hospital. The operation consists in the removal, with a chisel, of a wedge shaped piece of the tarsus with the base of the wedge directed downwards, so that when the osseous surfaces are brought into apposition the arch of the foot is restored. Coaptation and fixation is secured with two disinfected bone-nails and a plaster-of-Paris dressing. In all aseptic wounds the bone-nails disappear by absorption. He has done the operation forty times, and has never observed any serious results; and in only one case the deformity returned, and was permanently corrected by a second operation. He does not resort to this operation indiscriminately in every case of flat-foot, but only in such cases which do not yield to simpler measures, such as rest and fixation. About three months are required for firm bony union to take place, and he insists that the patients should not be allowed to step upon the foot before this has taken place, otherwise a return of the deformity would be inevitable.

An excellent proof of the care which is exercised in this old hospital in preventing wound infection, is the fact that all abdominal sections performed by Dr. Ogston and his colleagues, some thirty in number, recovered. For disinfection of the hands and field of operation the surface is washed with soap and warm water, and rubbed with a piece of pumice stone, after which it is washed with spirits of turpentine, and lastly with a five per cent. solution of carbolic acid. The instruments are treated with turpentine, washed with carbolized solution, and immersed in a five per cent. solution of carbolic acid. Dr. Ogston does not hesitate to walk from the dissecting room or after a course of operations upon the cadaver, directly into the operating room and perform any operation, and has never observed any ill results of such a course when the hands are thoroughly disinfected.

I witnessed two operations in his clinic. The first was for an abscess, which had evidently commenced in the lumbar region and had gravitated below Poupart's ligament. He prefers, in all these cases, to make a free incision just above the iliac crest, and drain the abscess from this point. He also called special attention to this method of operation, as it enabled the surgeon to seek for the cause of the suppuration in the lumbar region and the iliac fossa, and to remove the primary cause through the same incision should circumstances dictate such a course. He has never observed a ventral hernia after this operation.

The second case was one of fungous osteo-myelitis of the lower end of the femur, which had been operated upon some years ago, but the pain had recently returned. The femur was opened on the outer surface with the chisel, by removing quite a large piece of the compact layer. The interior was gouged out thoroughly, and after thorough cleansing and disinfection the cavity was allowed to fill with blood, after removing Esmarch's constrictor, and an

[1] By permission of Drs. Fenger and Senn.

antiseptic dressing applied. This manner of hastening the healing process in all wounds attended with loss of substance, first suggested by Schede, has yielded good results in Ogston's hands.

While in Edinburgh I called on Dr. Keith, and spent nearly two hours with him in conversation, which afforded me an excellent opportunity to become familiar with his views on hysterectomy and ovariotomy. Dr. Keith's personal appearance is striking and characteristic. Although not an old man, he shows only too plainly the effects of a life spent in the cause of his profession and for the benefit of suffering humanity. He walks with a stoop, his frail body being bent under the weight of many years spent in the performance of an arduous professional career. The wasted form and the deep furrows in his face only too plainly tell the story of the many anxieties, the hopes and the fears through which he has passed in affording relief to his many clients. A history of his life would reveal many a hard struggle which he encountered in his efforts to reach the prominent position he occupies, by universal consent, in the department of surgery, for which he has done so much in elevating it from the mire of empiricism to the dignity of a science. The unwritten history can be readily read upon his countenance, which shows only too plainly the effects of hard, conscientious work; the thoughtful and sad expression speaks of the many encounters with an ungrateful and unappreciative public, and the many sad experiences with a jealous profession. A look at his eyes, however, must satisfy any one that determination, energy and enthusiasm can live in a frail body. These qualities which he possesses will explain the mystery of the marvellous amount of work which he has accomplished, and the wonderful results he has obtained under circumstances which have discouraged even the strongest of men. When we realize the limited hospital advantages which are furnished him in the Royal Infirmary, we must admire the man who can show such results. The victories which have been so dearly bought at the expense of health, and in all probability of a portion of life itself, are the most appropriate and lasting monuments of an unselfish life spent in the interests of the profession of his choice and suffering humanity. In the Royal Infirmary he has sixteen beds and only one nurse. His son, Skene, is his assistant.

His operations are performed in a small room heated by an open grate fire, and but poorly supplied with light. Only a few students are invited to the operations. The patient is placed upon a board, to which she is fastened with a strap across the hips, and hands tied to it on each side; the board rests with each end upon a table, the operator and assistant standing one on each side between the tables. The room is disinfected before each operation with chlorine gas. The abdomen of the patient and hands of operator and assistant are washed with a strong alkaline solution for the purpose of removing the fatty substances, which, according to Keith, are carriers of the septic germs. After thoroughly washing the parts they are disinfected with a weak solution of corrosive sublimate. Sponges are used over and over, cleansing them after each operation in warm water, and subsequently in an alkaline solution; they are kept for use in a five per cent. solution of carbolic acid. During the operation they are kept immersed in a two per cent. solution of carbolic acid. The spray he has abandoned, since he has suffered from repeated attacks of hæmaturia, and if anything the results have been better since. Instruments are well cleansed after each operation, and during the operation they are kept in the strong solution of carbolic acid. All adhesions are carefully separated and each bleeding point tied with catgut. Ovarian cysts are tapped with a large straight trocar just as soon as the peritoneal cavity is opened.

From the descriptions I had read of his treatment of the pedicle I had always been afraid to adopt his method, but after I had seen the method applied I became convinced of its safety. The pedicle is firmly compressed in his clamp, and two or more cautery irons heated to a dull red heat are applied for a sufficient length of time to heat the metallic plates of the clamp sufficiently to gently cauterize the compressed portion of the pedicle. The compressed tissue must be rendered "dry," and when this has been accomplished it looks like a transparent membrane. Some practice is necessary to graduate the heat for each individual case, but when properly done hæmorrhage never occurs. Dr. Keith affirms that the tissues thus treated do not slough, but are speedily supplied with new blood-vessels. He has seen new blood-vessels in the cauterized portion of the stump after twenty-four hours. Before the clamp is removed each side of the pedicle is carefully seized with forceps which do not tear, and any vessel which might contain blood is separately tied. In the many hundred cases treated by this method hæmorrhage was never observed—certainly the best argument in favor of the reliability of the method. The only case of hæmorrhage after ovariotomy which he observed was in a case where both ovaries were removed; on one side the pedicle was treated with the cautery, on the other the ligature was applied. Patient died in six hours. The post-mortem examination showed that death had been caused from hæmorrhage which had taken place at a point where the pedicle had been perforated with a forceps for passing the ligature; the forceps had injured a vein wall, and from the opening thus made the hæmorrhage had occurred.

Suturing of the abdominal wound is certainly done more neatly and thoroughly by Keith than any other ovariotomist. Medium-sized silk is used, cut in length of about eight inches, each end of a suture is mounted with a long, delicate needle, which bears the operator's name. The needles are passed from within outward, and after all sutures are in place they are picked up in a bundle on each side and the abdominal wall gently lifted so as to bring the peritoneal surfaces in accurate apposition, and while an assistant holds the parts in this position by making pressure on each side with his hands, the sutures are tied. To every inch at least three sutures are used. The skin is accurately united by applying a horse-hair suture between each of the silk sutures, thus securing the

most accurate approximation and coaptation of the margins of the wound. After excision of the breast he relies entirely upon the horsehair suture. The wound is covered with a small compress of hygroscopic gauze wrung out of a solution of 1 part of carbolic acid and 7 parts of glycerine. Over this a compress of common gauze or cotton is placed, and the whole retained in place with a flannel bandage. This dressing is allowed to remain for a time, when it and the sutures are removed. The bowels are kept quiet for a week, when a gentle laxative is administered. Catheterization is avoided whenever the patient is able to pass the urine without assistance.

N. SENN.

DOMESTIC CORRESPONDENCE

"RECTAL SURGERY MADE EASY."

Dear Sir:—In a former article in THE JOURNAL I exposed the "systems" of rectal surgery practised by numerous Western itinerants and charlatans. In that article I referred to the little rectal "pockets and fringes" or "pockets and papillæ," described by various standard authors, and well known to anatomists as existing at the base of the columns of Morgagni, just above the verge of the anus. A writer of certain lectures and essays on the subject had claimed these as being mainly his own discovery, and urged that they were "lesions," and fearfully bad ones at that; in short, that they should always be snipped out when found. I maintained, on the other hand, that these minute organs were natural, and composed of healthy mucous membrane and connective tissue. I remarked, however, that, like other organs of the body, they sometimes became diseased and required surgical attention, but were not themselves diseases requiring to be split and snipped in ordinary cases.

The *Peoria Medical Monthly* avers that, by admitting such occasional disease and need of surgical attention, I concede all that the author of the essays claims. The editor of the *Monthly* is mistaken as to what had been promulgated. The writer of the essay on "Pockets and Fringes," or "Pockets and Papillæ," as he elsewhere calls them, has shown no disposition to hide himself or his ideas in a corner. He has expressed himself fully on every possible occasion, and loudly makes the following claims:

1. That, as to these "pockets and papillæ," "no mention of them can be found in current literature;" though they are described in various works, both old and new.

2. That these little natural irregularities are "lesions," of the most fearful, health-destroying power.

3. That "they always occasion a spasmodic contraction of the sphincter ani."

4. That "their removal is invariably attended by improvement;" though many patients have got worse instead of better under the treatment.

5. He says: "I am now, as I was two years ago, in favor of removing these rectal pockets under all circumstances, and in all cases in which they are found."

6. He remarks: "I look upon these conditions as being the most mischievous of rectal disorders."

7. He emphasizes with italics the following: "*In all pathological conditions, surgical or medical, which linger persistently in spite of all efforts at removal, from the delicate derangements of brain-substance that produce insanity, and the various forms of neurasthenia, to the great variety of morbid changes repeatedly found in the coarser structures of the body, there will invariably be found more or less irritation in the rectum or the orifices of the sexual system.*" He adds in substance as he proceeds, that while piles, fistulæ, etc., do more or less injury, the principal part of all the above-mentioned obstinate diseases of every part of the body are caused by the "pockets and papillæ" of the rectum, and that the snipping of them out is "invariably attended by more or less improvement." Were good old Hahnemann alive, this etiology of one of his followers would make his hair stand on end.

The writer has made some special rectal dissections in this connection, and may have occasion at a future time to show how the peculiar banded arrangement and loose submucous connections of the thin mucous membrane of the part tend to deceive the unwary examiner.

EDMUND ANDREWS, M.D.

6 Sixteenth St., Chicago, May 5, 1887.

GALVANIC DOSAGE.

Dear Sir:—I have no wish to enter into the controversy that seems to be raging between several of your correspondents on the subject of galvanic dosage, but a statement made by Dr. Martin in his article on the "Treatment of Fibroid Tumors of the Uterus by Electrolysis," which appeared in your issue of April 23, is so remarkable as to call for correction in the mere interest of humanity.

Really strong currents are now becoming possible by the use of direct dynamo circuits or of secondary batteries of sufficient electromotive pressure, and should some physician while using them put Dr. Martin's directions about dosage in practice, the result would be most disastrous to the patient. The particular statements referred to, which appear also in Dr. Martin's letter in the same issue, are those in which he claims to have applied currents varying from 250 to 1000 milliampères without unfavorable results, and even as much as 10 ampères (10,000 milliampères) without giving excessive pain. Since Dr. Martin takes occasion to describe a milliampère meter in his paper, which he states to be correct and evidently uses himself, the extrordinary nature of these claims remained a mystery until the last paragraph of the third section of his paper (page 450) was scanned. He there states that his 1000 ma. were obtained from a battery of 115 gravity cells. Such a thing is utterly impossible, for these cells present an internal resistance of at least 10 ohms apiece —more often 13 to 15 ohms. Placing it at 10 ohms, the total internal resistance of the battery of 115 gravity cells would be 1150 ohms, and with the electromotive pressure of each cell taken as one volt (which is rather high) the greatest amount of current

obtainable from the battery with the metallic poles brought directly together will be shown by the following calculation: 115 volts divided by 1150 ohms equals 0.1 ampère or 100 ma. But as soon as his patient is inserted in the circuit even this amount of current becomes impossible. If one electrode is large and one applied beneath the skin by puncture, the resistance of the body may possibly add only about 850 ohms to the circuit, making a total of 2000 ohms. This changes the results to the following: 115 volts÷2000 ohms=0.0575 ampère or 57 milliampères. This calculation is a simple application of the most rudimental law in electrophysics, and it is but just to suppose that the gentleman making the important blunder pointed out had forgotten about his battery resistance and its effect upon his figures, although the mistaking of 50 milliampères for 1000 is a trifle startling. But even the 40 or 50 ma. really used by Dr. Martin are strong doses when applied to the delicate lining membrane of the uterus or concentrated at a single point within the tissues, and it would seem that some words of caution might be added to both his and Apostoli's commendation of these methods respecting the dangers as well as advantages of such vigorous electrolysis. In my own practice 10 to 15 ma. have been generally sufficient.

Very respectfully yours,

G. BETTON MASSEY, M.D.

1706 Walnut St., Philadelphia, May 2, 1887.

ASSOCIATION ITEMS.

AMERICAN MEDICAL ASSOCIATION.

The Thirty-eighth Annual Session will be held in Chicago, Ill., commencing on Tuesday, June 7, at 11 A.M., in Central Music Hall, corner of State and Randolph streets, and will continue four days. Good rooms for the several Sections will be provided as near the hall for general meetings as possible. Registration books will be open in Central Music Hall on Monday, the day preceding the meeting, for those who wish to register early.

In addition to the list of papers for the Sections published last week the following subjects are announced:

Section on Practice of Medicine.

C. H. Hughes, St. Louis, Mo., will present a "Unique Case of Athetosis resulting from Railway Shock." F. C. Schæfer, Chicago, will present a case of "Complete Loss of Scalp, including the greater portion of the Eyelids and one Ear. Treatment by Skin-Grafts. New Scalp."

Section on Surgery and Anatomy.

Edmund Andrews, Chicago, Ill., "On the Solution of Necrosed Bone in Spinal Abscess by Dilute Hydrochloric Acid."

Geo. E. Stubbs, Philadelphia, Pa., "Wound Dressing—Some Notions Accepted, and some under Discussion."

Section on Ophthalmology, Otology and Laryngology.

J. W. Wright, Columbus, Ohio, "Evulsion as a Means for the Radical Removal and Cure of Pterygium;" G. C. Savage, Nashville, Tenn., "The Function of the Oblique Muscles in Certain Cases of Astigmatism;" Edward Jackson, Philadelphia, Pa., "The Effects of Obliquity of the Correcting Lens to the Visual Axis, with practical deductions; also "A New Form of Facial Frame;" Seth S. Bishop, Chicago, "Treatment of Hay Fever;" "Treatment of Chronic Suppurative Inflammation of the Middle Ear."

Section on Medical Jurisprudence.

Joseph Jones, New Orleans, La., "A Claim to Priority in the Determination of the Chemical and Microscopical Characters and Changes of the Blood in the various forms of Malarial Paroxysmal Fever, and the application of the results of their investigations to Medical Diagnosis and Medical Jurisprudence;" Marshall D. Ewell, Chicago, Ill., "Micrometric Measurements, as applied to the measurement of Blood Corpuscles in Medico-Legal Cases;" John Godfrey, U. S. Marine Hospital Service, Louisville, Ky., "Expert Testimony;" H. M. Bannister, Eastern Illinois Hospital for the Insane, Kankakee, Ill., "The Criminal Responsibility of Epileptics;" Rev. Louis Thebaud Jones, Moweaqua, Ill., "The Intimacy of the Medical and Clerical Professions, with the Supremacy of the Former in the Sociological Sense, at Least;" H. C. B. Alexander, Chicago, Ill., "Forensic Relations of the Puerperal State;" John V. Shoemaker, Philadelphia, Pa., subject not stated.

Section on Obstetrics and Diseases of Women.

W. W. Potter, Buffalo, N. Y., "A case of Pyosalpinx—Cure without Operation;" C. R. Reed, Middleport, O., "Case of Tubal Pregnancy, with Specimen of the Anomaly;" Joseph Eastman, Indianapolis, Ind., "Uterine Subinvolution and Areolar Hyperplasia."

RAILWAY RATES.

The following named roads will give reduced fares to all delegates, members, and their families attending the meeting. Return tickets will be issued on the certificate plan *only*. Tickets for the return journey will be sold at ⅓ the highest regular limited fare. If there is no limited fare to a desired point, the price will be ⅓ the unlimited fare. Tickets for the return journey will be limited to continuous passage by first train after they are bought. All tickets for return journey must be accompanied by a certificate signed by the Chairman of the Committee on Transportation, or by an authorized member of the Committee, showing that the holder has attended the meeting. Tickets are good for 10 days from date of purchase.

The roads which will accept return tickets on the certificate plan are:

Baltimore & Ohio (west of the Ohio River).
Buffalo, New York and Philadelphia.
Chicago & Grand Trunk.
Cincinnati, New Orleans & Texas Pacific.
Chicago, Vincennes & Cairo Line.
Chicago & West Michigan.
Chicago, St. Louis & Pittsburgh.
Cincinnati, Hamilton & Dayton.
Cincinnati, Indianapolis, St. Louis & Chicago.
Cincinnati, Washington & Baltimore.
Cleveland, Akron & Columbus.
Cleveland & Marietta.

Cleveland & Pittsburgh.
Cleveland, Columbus, Cincinnati & Indianapolis.
Cleveland, Lorain & Wheeling.
Columbus & Cincinnati Midland.
Columbus, Hocking Valley & Toledo.
Chesapeake & Ohio.
Chicago & Atlantic.
Dayton & Ironton.
Detroit, Lansing & Northern.
Dayton & Union.
Detroit, Grand Haven & Milwaukee.
Evansville & Terre Haute.
Flint & Pere Marquette.
Fort Wayne, Cincinnati & Louisville.
Grand Rapids & Indiana.
Grand Trunk.
Indianapolis & St. Louis.
Indianapolis & Vincennes.
Indianapolis, Bloomington & Western.
Indianapolis, Decatur & Springfield.
Jeffersonville, Madison & Indianapolis.
Kanawa & Ohio.
Lake Erie & Western.
Lake Shore & Michigan Southern.
Lousiville & Nashville.
Louisville, Evansville & St. Louis.
Louisville, New Albany & Chicago.
Michigan Central.
Michigan & Ohio.
New York, Chicago & St. Louis.
New York, Pennsylvania & Ohio.
Niagara Falls Short Line.
Ohio & Mississippi.
Pennsylvania.
Peoria, Decatur & Evansville.
Pittsburgh & Lake Erie.
Pittsburgh & Western.
Pittsburgh, Cincinnati & St. Louis.
Saginaw Valley & St. Louis.
Scioto Valley.
Toledo & Ohio Central.
Toledo, Peoria & Western.
Valley Railway.
Vandalia Line.
Wabash Railway.
Wheeling & Lake Erie.
Baltimore & Ohio (east of Parkersburg, Bellaire & Wheeling.)
Baltimore & Potomac.
Bennington & Rutland.
Boston & Albany (on business between common points in New England and points west of, but not including Albany.)
Boston & Lowell.
Boston, Hoosac Tunnel & Western.
Buffalo, Rochester & Pittsburgh.
Camden & Atlantic.
Central Vermont.
Delaware & Hudson Canal Co.
Delaware, Lackawanna & Western.
Fitchburg.
Lehigh Valley.
New York Central & Hudson River.
New York, Lake Erie & Western.
New York, Ontario & Western.
Norfolk & Western.
Northern Central
Philadelphia & Erie.
Philadelphia & Reading.
Philadelphia, Wilmington & Baltimore.
Rome, Watertown & Ogdensburg.
Shenandoah Valley.
Troy & Boston.
West Jersey.
West Shore.

The following named lines offer one and one-third fare for round trip:

Burlington, Cedar Rapids & Northern Railway.
Central Iowa Railway.
Chicago & Alton Railroad.
Chicago & Northwestern Railway.
Chicago, Burlington & Northern Railway.
Chicago, Burlington & Quincy Railroad.
Chicago, Milwaukee & St. Paul Railway.
Chicago, Rock Island & Pacific Railway.
Chicago, St. Paul, Minneapolis & Omaha Railway.
Green Bay, Winona & St. Paul Railroad.
Hannibal & St. Joseph Railroad.
Illinois Central Railroad.
Kansas City, St. Joseph & Council Bluffs Railroad.
Milwaukee & Northern Railroad.
Milwaukee, Lake Shore & Western Railway.
Minneapolis & St. Louis Railway.
Minnesota & Northwestern Railroad.
Missouri Pacific Railway.
Rock Island & Peoria Railway.
Sioux City & Pacific Railroad.
Wabash Western Railway.
Wisconsin Central Lines.

[Other roads will be added as heard from. These lists have been prepared at great expenditure of time by the Chairman of the Committee on Transportation,

DR. LISTON H. MONTGOMERY,
Briggs House, 189 Randolph St., Chicago,

who should be addressed for additional information.]

A list of forty-two Southern roads which will accept return tickets issued under the certificate plan, to members, delegates and their families, who attend the coming meeting of the American Medical Association, providing as many as twenty-five delegates go to Chicago, hold certificates of the Southern Passenger Association, properly signed by the ticket agent at the starting point. The certificate entitling those to return at one-third fare, must be vouched for by the Chairman of the Committee on Transportation, certifying that said member or person has been in attendance at the meeting. Said certificate, however, is good only twenty hours after adjournment:

Alabama Great Southern Railroad.
Atlanta & West Point.
Brunswick & Western,
Central Railroad of Georgia.
Central Railroad of South Carolina.
Charleston & Savannah.
Cheraw & Darlington.
Cheraw & Salisbury.
Cincinnati, New Orleans & Texas Pacific.
East Tennessee, Virginia & Georgia.
Georgia.
Georgia Pacific.
Illinois Central (south of Ohio River).
Jacksonville, Tampa & Key West.
Louisville & Nashville (south of Ohio River).
Louisville, New Orleans & Texas.
Memphis & Charleston.
Mississippi & Tennessee.
Mobile & Ohio (south of Ohio River)
Nashville, Chattanooga & St. Louis.
New Orleans & North-Eastern.
Norfolk & Western.
North-Eastern Railroad of Georgia.
North-Eastern (of South Carolina).
Pennsylvania (south of Washington).
Petersburg.
Port Royal & Augusta.
Raleigh & Gaston.
Richmond & Alleghany.
Richmond & Danville, and leased lines.
Richmond, Fredricksburg & Potomac.
Richmond & Petersburg.
Rome.
Savannah, Florida & Western.
Seaboard & Roanoke.
Shenandoah Valley (south of Potomac River.)
South Carolina.
Vicksburg & Meridian.
Western & Atlantic.
Western Railway of Alabama.
Wilmington, Columbia & Augusta.
Wilmington & Weldon.

HOTEL RATES.

In addition to the list given last week, the New Brevoort House offers rooms on the European plan to delegates at 75 cents where two or more persons occupy a room. This House is refitted and refurnished throughout with all modern conveniences, steam passenger elevator, etc.

CHARLES GILMAN SMITH, M.D.,
Chairman Local Committee of Arrangements.
LISTON H. MONTGOMERY, M.D.,
Chairman Committee on Transportation.

MISCELLANEOUS.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION will hold its next annual meeting in Baltimore, May 31 and June 1, 1887, immediately preceding the days for the meeting of "The Association of American Physicians" in Washington, D. C. The Secretary is J. B. Walker, M.D., 1617 Green street, Philadelphia, Pa.

DR. OSCAR C. DE WOLF, the efficient Health Officer of this City, has been reappointed by Mayor Roche.

A PUBLIC HEALTH CONFERENCE will be held in Louisville, Ky., on May 24 and 25, under the auspices of the State Board of Health.

REGULATION OF PRACTICE IN MICHIGAN.—A bill to regulate the practice of medicine in Michigan has just passed the lower House of the Legislature.

THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA met in its seventeenth annual session in San Francisco, April 20, 1887. The following were chosen officers for the ensuing year:

President—R. H. Plummer.
First Vice-President—A. H. Agard.
Second Vice-President—David Powell.
Third Vice-President—H. N. Rucker.
Fourth Vice-President—L. M. F. Wanzer.
First Assistant Secretary—J. H. Parkinson.
Second Assistant Secretary—G. W. Davis.
Treasurer—G. C. Simmons.
Board of Censors—Jules Simon, W. Anderson, J. D. Arnold, I. E. Oatman, C. G. Kenyon.
Board of Examiners—C. E. Blake, W. Lawlor, Jules Simon, C. H. Steele, T. J. Le Tourneux, C. E. Farnum, A. H. Pratt.
Alternates—H. H. Hart, C. C. Wadsworth, A. P. Whittell.

The Committee on Appropriation for the Ninth International Congress, recommended that $100 be donated. Adopted.

Regulation of Medical Practice.—The following resolution was adopted: "That it is the sense of this Society that the best interests of the public and the medical profession will be better subserved by one State Board of Examiners rather than more; and by examination of applicants rather than of diplomas; and that there should be proper provisions made for expenses of such Board."

Vaccination.—The following resolution was adopted: That it is the sense of the members of the California State Medical Society, in convention assembled at San Francisco, at its regular annual session, that vaccination should be made compulsory, and that the State Legislature should be urged to enact such laws as shall result in the protection of the entire population from small-pox.

[We are indebted to the *Sacramento Medical Times* for advance sheets of this report.]

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM APRIL 30, 1887, TO MAY 6, 1887.

Major Blencowe E. Fryer, Surgeon, ordered for examination by Army Retiring Board, at San Francisco, Cal. S. O. 101, A. G. O., May 2, 1887.

Major George M. Sternberg, Surgeon, assigned by the President to the special duty, under the Treasury Department, of "investigating the merits of the method practised in Mexico and Brazil for preventing yellow fever by inoculation." Relieved from duty as attending surgeon and examiner of recruits in Baltimore, Md. S. O. 101, A. G. O., May 2, 1887.

Major John S. Billings, Surgeon, granted leave of absence for ten days, to take effect May 3, 1887. S. O. 98, A. G. O., April 28, 1887.

Major J. V. D. Middleton, Surgeon; Major J. C. G. Happersett, Surgeon; Capt. F. C. Ainsworth, Asst. Surgeon, appointed to assemble at U. S. Military Academy, West Point, N. Y., on June 1, to examine into the physical qualifications of the members of the graduating class and of the candidates for admission to the Academy. S. O. 102, A. G. O., May 3, 1887.

Capt. Leonard Y. Loring, Asst. Surgeon, sick leave of absence still further extended six months, on surgeon's certificate of disability. S. O. 103, A. G. O., May 4, 1887.

Capt. Victor Biart, Asst. Surgeon, sick leave of absence still further extended one year, on surgeon's certificate of disability. S. O. 99, A. G. O., April 29, 1887.

First Lieut. Chas. B. Ewing, Asst. Surgeon, ordered from Ft. Leavenworth, Kan., to Ft. Lewis, Col., for temporary duty. S. O. 100, A. G. O., April 30, 1887.

OFFICIAL LIST OF CHANGES IN THE MEDICAL CORPS OF THE U. S. NAVY, DURING THE WEEK ENDING MAY 7, 1887.

Shafer, Joseph, Asst. Surgeon, detached from the "Minnesota," and to the "Ossipee."

Simon, W. J., Surgeon, ordered to the U. S. Str. "Boston."

Henry, C. P., Asst. Surgeon, detached from hospital, Philadelphia, and to the "Boston."

Means, Victor C. B., Asst. Surgeon, detached from hospital, Mare Island, and to the hospital, New York.

Simons, Manly H., P. A. Surgeon, detached from Naval Academy, and to the "Constellation."

Diehl, Oliver, P. A. Surgeon, detached from hospital, New York, and to the hospital at Philadelphia.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE HOSPITAL SERVICE FOR THE FOUR WEEKS ENDED MAY 7, 1887.

Goldsborough, C. B., Surgeon, leave of absence extended thirty days on account of sickness. April 20, 1887.

Devan, S. E., P. A. Surgeon, granted leave of absence for thirty days, to take effect when relieved. April 12, 1887.

Bratton, W. D., Asst. Surgeon, to proceed to Port Townsend, W. T., and assume temporary charge of the service. April 21, 1887.

Wyman, Walter, Surgeon, detailed as chairman, Board for physical examination of candidates for appointment as cadet, Revenue Marine Service. May 6, 1887.

Mead, F. W., P. A. Surgeon, detailed as recorder Board for physical examiuation of candidates for appointment as cadet, Revenue Marine Service. May 6, 1887.